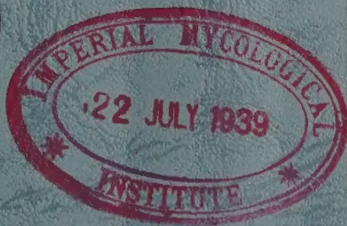


BASUTOLAND

ANNUAL REPORT

DEPARTMENT OF AGRICULTURE

For the Report Year ended September 30th, 1938.



BASUTOLAND.

Annual Report of the Department of Agriculture For the Report Year Ended September 30th, 1938.

The Annual Report of the Department of Agriculture is divided into three divisions:—

- (i) Agriculture.
- (ii) The Engineering Section; Anti-Soil Erosion and Irrigation Works.
- (iii) Veterinary and Livestock.

The staff operating the three divisions, and the details of the work performed, are given in the divisional reports.

The Administrative Staff and certain general questions of policy and aspects of the work are dealt with in this covering report.

ADMINISTRATIVE STAFF.

EUROPEAN:

R. W. Thornton, C.B.E., Director of Agriculture.
E. D. G. P. Heering, Accounting Clerk.
R. F. S. Heering, Clerk.
Miss M. Cumberlidge, Lady Clerk and Typist.
Miss A. M. Evans, Lady Clerk and Typist.

NATIVE:

B. M. Monyake, Clerk.
J. C. Masithela, Clerk.
C. Molapo, Clerk.

ORGANISATION AND POLICY.

The full details given on organization and policy in last year's Annual Report, covered the system of organization within the Agricultural Department, and clearly showed the co-operation which exists between the Agricultural and other Departments concerned; particularly the assistance rendered to this Department by the Administrative side of the Government. It therefore only remains to be said that the excellent relations previously established continue to function.

AGRICULTURAL AND LIVESTOCK PROJECTS.

It is thought desirable in this the fourth Annual Report issued by the Department (the first was issued in 1935), to enumerate clearly and shortly the chief projects on which the Department is engaged for the benefit of the country and its agricultural and livestock industries. These projects have been outlined as individual items, and the progress and results secured have been given in the Annual Reports since 1935; but the time is now considered opportune, after several years of concentrated endeavour, to show, in summarised form, the nine principal projects and results secured. Before doing so, however, it may be as well to repeat here, very shortly, what was shown fully in last year's report, namely, that all the measures taken are directed towards—

- (a) the preservation and improvement of the agricultural and pastoral land in Basutoland;
- (b) the improvement and maintenance of the health of the people by the use of a proper diet, etc.;
- (c) gradually providing the people with an improved income derived from agriculture and stock-raising.

The projects are as follows:—

(1) DIRECT ANTI-EROSION WORK.

- (a) The diversion and checking of sluits or dongas, and terrace banking to check the very bad sheet erosion which has taken and is taking place, particularly on most of the cultivated land in Basutoland.
- (b) Tree planting in protected and semi-protected eroded areas to check further erosion, and to provide fuel and hut building material for the people.
- (c) The sowing and planting of grass and other plants on terrace banks, etc.
- (d) The cultivation of fields on the contour.

The Engineer in his report shows the results achieved, but it is desirable to add one item to what he has said, namely, that in the earlier reclaimed sections the recovery from denuded semi-desert conditions has been such that unless photographic records had been maintained annually, illustrating the conditions that existed prior to and since the work was undertaken, it would be hard to believe to-day that the reclaimed areas could have recovered so rapidly.

(2) PASTURE MANAGEMENT.

Certain extensive and very simple experiments were inaugurated four years ago. These have given some interesting and valuable indications and results. As a result of the Ecological Survey carried out in 1936, the first set of very accurate and intensive pasture experiments were laid down in the lowlands during the year. These will, in course of time, provide accurate data on pasture management in the lowlands. A similar set of experiments has been planned for the mountain area. The recommendations made in the Ecological Survey Report provide for the introduction of a broad system of pasture

management and livestock distribution in the mountains, in order to preserve the pasture and check further erosion. The scheme also covers the protection of cultivated fields, most of which are placed on slopes with a grade varying from 30 per cent. to 50 per cent. It is hoped to introduce this scheme and gradually to bring about the permanent preservation of the most extensive and valuable area of Basutoland.

From the foregoing it will be seen that the two main objects are to check existing and prevent future erosion, and to preserve the richest pastoral and agricultural land in the territory.

(3) CROP IMPROVEMENT.

The work under this heading has been largely concentrated on:

- (a) Correct cultural methods.
- (b) The use of good seed.
- (c) Fertilizing or manuring.
- (d) Diversity of crops.

Every measure used, from crop competitions and the distribution of good seed to fertilizing, etc., aims firstly at maintaining fertility and producing a sufficient quantity of suitable food to feed and maintain the people in good health, and secondly at providing a surplus of good products for sale. Naturally, most of the success of the project is dependent on climatic conditions. There are at present many indications, such as the crop production figures given in the Agricultural Officer's reports, particularly in the past two years, that the production of wheat and peas in addition to the standard crops—maize and kaffir corn (sorghum)—has made considerable progress. There is plenty of evidence available to show that the people are learning to store the surplus stocks of grain secured during a good season for use during a possible succeeding lean period, and that they only sell this grain when the next crop has been harvested and stored.

(4) TERRACED VEGETABLE AND FRUIT GARDENS.

The principal objects aimed at under this project are:—

- (a) To provide a suitable diet in the interest of the health of the people.
- (b) To check erosion by means of the watering facilities provided and the terracing of the land by the people.
- (c) To ensure a plentiful supply of food from a small area of well worked land. The food thus furnished will make available for sale a greater surplus of the standard grains, such as mealies, kaffir corn, wheat, etc.
- (d) To encourage the making of compost. No garden has a chance of winning a prize in the competitions mentioned in the Agricultural Officer's report, unless it is provided with a good compost pit and compost. His report shows the remarkable progress made in the number of gardens established.

(5) MERINO SHEEP IMPROVEMENT.

The Merino sheep provide the people with their biggest cash income, and have, therefore, received considerable attention, viz.:—

- (a) The writer's predecessor, Mr. Verney, cleared the country of scab. This was a remarkable achievement in view of the mountainous nature of the country and the stage of development reached by the people at that time.
- (b) The first step introduced, during the period under review in this report, was to eliminate the remaining Bastard rams which were causing rapid deterioration of the Merino wool.
- (c) High-class Merino flock rams have been introduced annually in considerable numbers, and have been re-sold to the Native farmers at cost price.
- (d) Universal dosing, for which the people pay, was introduced to eliminate internal parasites. These parasites were responsible for an annual decrease in the sheep population; latterly this decrease far exceeded the increase by breeding. Last season for the first time for many years the annual census revealed an increase.
- (e) During this report year wool classing on a comprehensive scale, after several years of experimenting, was undertaken with good results. The Principal Veterinary Officer's report shows briefly and clearly the excellent response and results secured.

(6) CATTLE IMPROVEMENT.

The main organization and work of this project are divided under three heads:—

- (a) The elimination of scrub bulls under a voluntary system.
- (b) The purchasing and introduction of good bulls, under what are known as the Bull Camp and Loan Schemes.
- (c) The prevention of the importation first of scrub males, and more recently, during the past year, of scrub females and oxen.

The Principal Veterinary Officer's reports for last year and for the present year give the position with regard to the progress made with this project.

(7) EQUINE IMPROVEMENT.

The Principal Veterinary Officer's reports for this year and for preceding years show the steps taken for the improvement of equines in this territory, and also show the active support accorded this project by the people. The project is divided under three main heads:—

- (a) The gradual elimination of undesirable sires on a voluntary basis.

- (b) The purchasing and introduction of good sires, under what is known as the Loan Scheme, with a view to the general improvement of the horses throughout the territory and the building up of local studs.
- (c) The purchasing and introduction of Catalonian Donkey Jacks, under the Loan Scheme, for the breeding of mules which are greatly needed for transport purposes in the territory, and for which animals there is, as in the case of good horses, a readily available outside market, not only in South Africa but elsewhere.

(8) LIVESTOCK MARKETS.

Four selling centres with the necessary sale pens, at which livestock can be sold for cash by public auction, were established during the year. It is hoped that this new venture will gradually become popular, in view of the encouraging results obtained at an experimental sale held during the year.

(9) PRODUCE MARKETS AND COMMERCIAL AGRICULTURAL SHOWS.

- (a) Produce markets have now been successfully established at four centres in the territory and are becoming increasingly popular. At two of the centres the necessary market shelters have been erected, chiefly through the efforts and means supplied by the producers.
- (b) Commercial Agricultural Shows. These shows have been styled as "Commercial" because every endeavour is being made, by means of the prize list, etc., to induce the exhibitors to exhibit not fancy items but the saleable lines of produce and stock produced as an outcome of the Government's policy to establish sound economics in production, both for internal consumption and for export.

The foregoing summary of the principal agricultural projects indicates the lines of concentrated effort being pursued. Such concentrated effort on the most essential items for the promotion of the welfare of the country and people, prevents diffusion of effort; diffusion of effort usually results in little progress; whereas, sustained concentrated effort on a few major items must ultimately lead to the establishment of these as part of the life of the people.

It is desired in this report to record my thanks and appreciation to all those who have supported the work, and particularly to my staff for their sustained effort and enthusiasm.

(Sgd.) R. W. THORNTON,

Director of Agriculture.

VETERINARY AND LIVESTOCK DIVISION.

PART I.

STAFF.

1—EUROPEAN STAFF.

- G. T. Henderson, M.R.C.V.S., Principal Veterinary Officer.
- S. J. Steenekamp, Agricultural and Livestock Officer, Butha Buthe.
- N. O. Halse, Assistant Agricultural and Livestock Officer, Mohale's Hoek.
- P. M. Wilhelm, Assistant Agricultural and Livestock Officer, Qacha's Nek.
- H. L. van Vuuren, Assistant Agricultural and Livestock Officer, Teyateyaneng.
- G. R. Chalmers, Assistant Agricultural and Livestock Officer, Maseru.
- J. G. S. Bennie, Assistant Agricultural and Livestock Officer, Mokhotlong.
- G. H. Larkan, Assistant Agricultural and Livestock Officer, Mafeteng.

2—NATIVE STAFF.

Clinical Branch.

- A. P. J. Mohasi, Veterinary Assistant (Grade II).
- C. R. D. Mahoete, Veterinary Assistant (Grade IV).

Field Branch.

- 3 Stock Inspectors (Grade III).
- 1 Stock Inspector (Grade IV).
- 59 Assistant Stock Inspectors (Grade V).
- 7 Clerks (Grade IV). (These men are also charged with certain field duties.)
- 16 Pack Grooms (ungraded).

Stud Branch.

- 2 Stud Grooms (Grade IV).

Central Pack Stables.

- 4 Pack Grooms (ungraded).

3—ADMINISTRATION.

The headquarters of the division is at Maseru, and the postal address is Post Office Box 24, Maseru.

4—FINANCE.

The total Veterinary Vote for the financial year ending 31st March, 1939, is £21,161.

5—EUROPEAN STAFF (Movements and Changes).

During the year the Principal Veterinary Officer acted as Judge at the horse classes for the Witwatersrand Agricultural Society. In addition a number of visits were paid to the Union for the purpose of purchasing stallions and donkey "Jacks" for the equine improvement scheme.

One member of the European Field Staff attended the three months' specialised course in sheep, wool and allied agricultural subjects at Glen Agricultural College, and obtained the certificate. Another member attended a course in sheep and wool at the Grootfontein Agricultural College and passed his Learner-Classifier examination. The same member qualified for a National Wool Growers' Association Diploma.

An Assistant Veterinary Officer was appointed during the year, and he hopes to take up his duties as soon as his transfer from the Union can be arranged. Five members of the European Field Staff were appointed to the permanent pensionable establishment. The post of Senior Sheep Inspector was abolished.

A member of the European Veterinary Field Staff was transferred to the Agricultural Division, as Agricultural and Livestock Officer with headquarters at Quthing, and his place is to be filled by the Assistant Veterinary Officer, of whom mention has already been made.

6—NATIVE PERSONNEL.

The designations "Scab Inspector" and "Dipping Supervisor" were abandoned, and that of "Stock Inspector" and "Assistant Stock Inspector" respectively substituted; both designations were considered anomalous in view of the fact that the territory has been free of scab for the past seven years.

7—CLINICAL STATION.

The total revenue accruing from the Clinic was £163. 7s. 1d., as compared with £156 6s. 4d. collected during the previous year. A table is appended showing the number of animals treated during the year at the Clinic:—

EQUINES.		CATTLE.		DOGS.		CATS.	
Operations.	Treated.	Operations.	Treated.	Operations.	Treated.	Operations.	Treated.
140	2,258	50	524	2	135	2	16

Cattle inoculated at the Clinic for:—

Anthrax.	Anaplasmosis.	Quarter Evil.
2,602	214	373

8—CENTRAL PACK STABLES.

The Central Pack Stable at Maseru of which mention was made in the 1936/37 report has proved an unqualified success by increasing efficiency and securing economy.

During the year authority was obtained to increase the equine pack strength from 20 to 24 animals, to meet the demands of the service. It is hoped that authority will be granted during the 1939/40 financial year to extend the premises to accommodate the additional packs mentioned. During the year 22 treks were catered for.

9—REGISTRATION OF PRIVATELY OWNED EQUINE TRANSPORT.

The new system of registration of privately owned equine transport referred to in the 1936/37 report has proved very satisfactory. It has considerably reduced the amount of work and travelling that the old system involved by eliminating the necessity of annual revaluations. It has also tended to encourage officials to buy better mounts. Practically every equine owned and used by officials in the service of the Government has now been registered in accordance with the terms of the amended regulations governing animal transport. The total number of horses and mules entered in the register maintained by the Principal Veterinary Officer is 153. Of these 32 were written off for diverse reasons. The sum of £121. 5s. 0d. was paid out in compensation for 15 animals, 11 of which died whilst engaged on the public service. The balance were taken over by the Government as being redundant in terms of the regulations.

10—CENTRAL STUD STATION, MASERU.

Owing to increased demands it was found necessary to augment the number of stallions standing at stud from one to three. The Central Stud now consists of the following:—

Name of Sire	Pedigree.	Purchase Price.	Financial Year.
"Landing "	Dignitary— Ashore.	£105	1929-30
"Dark Warrior"	Happy Warrior —Othello's First	£ 60	1937-38
"Seeker "	Illustrious— The Quest.	£ 40	1938-39

During the year the following number of mares were served at the Central Stud, Maseru:—

Native owned mares.
107

European owned mares.
31

Of the 31 European owned mares referred to 15 were owned by Europeans resident outside the territory.

The revenue derived from the stud during the year amounted to £151 as compared with £74 15s. 0d. during the previous year.

11—EQUINE IMPROVEMENT PROJECT.

Details of this project appeared in last year's report and it is gratifying to record that the scheme has surpassed all expectations with regard to the care and management exercised by custodians of sires, and that horse and mule breeders are enthusiastically patronising it.

There are two divisions, viz.:—

1. Central Stud, Maseru, and 2. Field Division.

The following tables show the total number of stallions and Catalonian donkey "Jacks" introduced into the territory for service since the inauguration of the scheme:—

A.—HORSE STALLIONS.

Stud Number	Financial Year Introduced.	Name.	Pedigree.	Loaned to.	Where Standing.	District.	Remarks.
1	On hand from previous year.	Landing	By Dignitary— Ashore	—	Maseru	Maseru	Serving at Central Stud.
2	"	Kibosch	By Fire Escape— Oskosh	Chief Theko Makhaola	Motsekinyane's	Qacha's Nek	
3	"	Flacula	By Sunny View— Juanita	Headman Far- lane Molapo	Molapo's Village	Mafeteng	Sold to Headman Farlane Molapo at landed cost, in August, 1938.
4	"	Molybeaut	By Moly— Beauteous	Chief Mafa Matete	Mafa's Village	Mafeteng	
5	"	Dan-Agwalla	Bred in French Nigeria	Chief Solomon Mohale	Solomon's Village	Mafeteng	
6	"	Dan-Bulhu	Bred in French Nigeria	Chief Bereng	Phamong	Mohale's Hoek	
7	"	Negus	Ex Rhanleigh mare	Headman T. Meene	Meene's Village	Maseru	
8	"	Molycaste	By Moly— Policastro mare	Tsie Makhabela	Thaba Tseka	Qacha's Nek	
9	"	Molyneaux	By Moly—Double Ditch mare	Tiri Motiki	Tlokoeng	Mokhotlong	
10	"	Japhet	By Jubilant II— Double Ditch mare	Boomo Likepa	Mashai	Qacha's Nek	
11	"	Funny Beau	By Funny Bone— Corinth mare	Sub-Chief Matlere	Matlere Lerotholi's Village	Mokhotlong	
12	"	Reproachable	By Reproach— Flamant mare	Sub-Chief Nts'eke Molapo	Bokong	Leribe	Sold to Sub-Chief Nts'eke Molapo at landed cost, in February, 1938.

Stud Number	Introduced, Financial Year	Name.	Pedigree.	Loaned to.	Where Standing.	District.	Remarks.
13	On hand from previous year.	Resentful	By Reproach— Flamant mare	Harry Mots'eremeli Chief	Bokong	Leribe	Sold to Chief Moholobela See-iso at landed cost, in August, 1938.
14	"	Reproof	By Reproach— Flamant mare	Moholobela Seeiso	Moholobela's Village	Mafeteng	
15	"	Reprobate	By Reproach— Flamant mare	Phera Mohloua	Phera's Village	Butha Buthe	This horse stood at the Central Stud until Sept., 1938.
16	"	Reproachful	By Reproach— Flamant mare	Makoanyane Motsarapane	Likhetlane	Leribe	
17	"	Reproacher	By Reproach— Flamant mare	Mahlomola Letsie	Sebapala	Quthing	
18	"	Kimberley	By Reproach— Percheron— Thoroughbred cross	J. M. Mohale	Mpharane	Mohale's Hoek	
19	"	Murphy	By Pitchoon— Thoroughbred mare	Lekhoee Ramokhele	Tsoloane	Mohale's Hoek	This horse was introduced towards the end of Financial Year 1937-38.
20	"	Nomad	By a Thoroughbred horse— Dam unknown	S. Nkuebe	Nkuebe's Village	Quthing	
21	"	Popeye	By Longshanks— Philicombe	Caswell Setenane	Phoqoane	Mafeteng	This horse was introduced towards the end of Financial Year 1937-38.
22	"	Dark Warrior	Happy Warrior— Othello's First	—	Maseru	Maseru	

Stud Number	Financial Year Introduced.	Name.	Pedigree.	Loaned to.	Where Standing.	District.	Remarks.
23	On hand from previous year	Reveller	By Revel—Half bred mare	Molefinyane Tjabanane	Likhoele	Mafeteng	This horse was introduced towards the end of Financial year 1937-38
24	1938-39	Forest Chief	The Woods—Dam unknown	Tastere Morai	Mohlehle's Village	Mafeteng	
25	"	Monsigneur	By Monsieure—Leemte	Chief Moholobela	Moholobela's Village	Mafeteng	
26	"	Commence	Planet—Yvonne	Chief Mpiti Letsie	Sebapala	Quthing	
27	"	Drummer Boy	Tympanum—Dam unknown.	K. Tsolesa	Mekaling	Mohale's Hoek	
28	"	False Top	Polydox—False Bottom	Chadwick Mohapi	Red Hill	Maseru	
29	"	Beau	Matrimony—Parting Knell	Chief D. Bolokoe	Sefateng		
30	"	Black Eagle	Popular—Queenie	Malebanye Samuel Lefoka	Phamong	Mohale's Hoek	
31	"	Popinjay	Popular—Certainty	Eli Mohapi	Phamong	Mohale's Hoek	
32	"	Ginger Pop	Popular—Assurance	Tumo D. Ts'euoa	Kubung	Quthing	
33	"	Sophocles	Archimedes—Auratum	Headman Nthofela	Petlane's	Mafeteng	
34	"	Seeker	Illustrious—The Quest	Petlane Central Stud	Maseru	Maseru	This horse recently replaced No. 19, "Murphy," at the Central Stud, Maseru.
35	"	Riddle	Dignitary—Ryl Patch	Panta Makhate	Qhalasi	Mohale's Hoek	

B.—CATALONIAN DONKEY JACKS.

Stud Number	Financial Year Introduced.	Loaned to.	Where Standing.	District.	Remarks.
1	1936-37	Chief Mafa Matete	Mafa's Village	Mafeteng	
2	"	Headman Farlane Molapo	Molapo's Village	Mafeteng	
3	1937-38	Chief Solomon Mohale	Solomon's Village	Mafeteng	
4	"	Chief Sempe Nkuebe	Sempe's Village	Quthing	
5	"	Chief Soko M. Letsie	Chief Soko's Village	Mohale's Hoek	
6	"	Chief Mahlomola Letsie	Sebapala	Quthing	
7	"	Sub-Chief Samuel Lefoka	Lefoka's Village	Mohale's Hoek	
8	1938-39	Headman S. Rakosho	Maletsunyane	Maseru	
9	"	Chief Moholobela Seeiso	Matelile	Mafeteng	
10	"	Sub-Chief Caswell Setenane	Phoqoane	Mafeteng	
11	"	Lempetje Makhonofane	Likhoele	Mafeteng	
12	"	Headman Bereng Matsolo	Mekaling	Mohale's Hoek	
13	"	Chief Thaba Ts'oeu Lebona	Lebona's Village	Mohale's Hoek	
14	"	Ts'lu Moshoeshoe	Phamong	Mohale's Hoek	
15	"	Sub-Chief T. Posholi	Morifi	Mohale's Hoek	
16	"	Chief Maama Mohale	Lifateng	Mohale's Hoek	
17	"	Headman Matobako Mokobocho	Thabaneng	Mafeteng	
18	"	Sub-Chief Matlere Lerotholi	Matlere's Village	Mokhotlong	
19	"	Headman Richard Borotho	Richard's Village	Mokhotlong	
20	"	Edwin D. Shale	Qacha's Nek	Qacha's Nek	

It will thus be seen that under our equine improvement project 12 stallions and 13 donkey "Jacks" were introduced during the financial year 1938/39.

During the year under review authority was secured for the policy of the sale of Government owned stallions to Native horse breeders at landed cost under certain conditions.

Under this scheme three stallions were disposed of at landed cost. The resale of the three stallions reduces the total number of Government owned stallions in the territory as at 30th September, 1938, to 32. The total number of Catalonian "Jacks" is 20.

The total cost of the animals introduced during the financial year 1938/39, excluding landing and other costs, was:—

Horse Stallions	..	£408	6s. 8d.	Average Price	£34	0s. 6½d.
Donkey "Jacks"	..	£377	10s. 0d.	Average Price	£29	0s. 9¼d.

During the period 1/8/37—30/9/38, 170 mares were served by Government owned stallions on loan, and during the same period 17 horse mares were served by Government owned "Jacks." The small number of mares served is accounted for by the fact that many of the sires only became available at the end of the service season. It will be recalled that horse stallions and donkey "Jacks" are loaned by the Government to approved reputable Native residents of Basutoland, who are recognised as breeders and possessors of good quality mares. The selected custodians have to sign an agreement embodying certain conditions covering: (i) the care and management of the loaned animals; (ii) the registration of selected mares and progeny; (iii) the retention in the territory of certain registered colts progeny of the matings; (iv) custodians are not permitted to have a scrub stallion. They are authorised to serve their own mares free but to charge patrons of the stud a service fee of 10s. per mare which fee goes to the custodian to cover costs of erecting suitable stabling, and to provide proper feeding, etc. By this means it is hoped to eliminate in the course of time many undesirable stallions and to replace them by the progeny of the imported sires and selected mares. The lucerne seed issued to custodians of Government owned sires and "Jacks," to augment the fodder supplies, barley, oats, etc., for feeding the animals committed to their care, has proved most useful and as a result all these animals are in the pink of condition. All the custodians of animals loaned for equine improvement have provided good accommodation for their charges and consequently there is no cause for anxiety in this connection.

12—CATTLE IMPROVEMENT SCHEME.

Mention was made in the 1936/37 report of the measures adopted to improve the cattle of the territory. These may be enumerated briefly as follows:— (a) Prohibition by law of undesirable bulls entering Basutoland. (b) The erection of eight bull camps at widely separated sites in the territory and the stocking of these with 25 bulls; 21 of the Afrikander breed and 4 of the Sussex breed. (c) The prosecution of emasculation by moral persuasion to rid the country of scrub bulls.

Under (b) it will be remembered that each camp is approximately 100 acres in extent with a carrying capacity of 100 cows and only selected cows are allowed to be mated with the bulls. During the year under review a total of 571 cows were placed in the bull camps and of these 438 were served by the bulls mentioned. Unfortunately owing to an accident one of the bulls introduced during the 1937/38 financial year died. In addition to the measures briefly enumerated above the Government recently embarked on two auxiliary measures to expedite the process of cattle improvement. These are briefly outlined as follows:— (1) To augment the bull camp scheme by the purchase of bulls annually for distribution on loan as in the case of the equine improvement project, to approved reputable Native residents of Basutoland, who are recognised as reliable breeders. The selected custodians have to sign an agreement covering a period of two years, which embodies certain conditions regarding the care and management of the loaned animals, the registration of selected cows and selected male progeny, and refusal to accept cows for service if the owner has a "scrub" bull in his possession. Custodians are also not permitted to have a "scrub" bull. They are authorised to serve their own cows free but to charge patrons of the stud a service fee of 1s. per cow, which fee goes to the custodian to cover costs of up-keep, etc. By this means it is hoped to eliminate, in the course of time, many "scrub" bulls from the territory and replace them by the progeny of the imported sires and selected dams.

During the year under review the Government purchased 44 pure bred bulls (38 Afrikaner and 6 Sussex) from reputable breeders in the Union for distribution under the above scheme.

To illustrate the popularity of the scheme, over a hundred applications were received from Native farmers but as only a limited amount of money was available for the purchase of bulls many applicants are obliged to wait until next financial year, when a further quota of bulls will be available. Unfortunately owing to an accident one of the Afrikaner bulls introduced during the 1938/39 financial year had to be destroyed and another one died following inoculation against Anthrax.

The following table shows the distribution of the bulls:—

District.	No. of Bulls Distributed.	Afrikaner.	Sussex.
Maseru	4	4	—
Mafeteng	5	5	—
Mohale's Hoek	6	5	1
Quthing	5	5	—
Qacha's Nek	5	3	2
Mokhotlong	4	3	1
Butha Buthe	3	3	—
Leribe	7	5	2
Berea	3	3	—
Total	42	36	6

The following table shows the total number of Government owned bulls in the territory including those serving in the bull camps mentioned in the 1936/37 report:—

District.	No. of Bulls.	Africander.	Sussex.
Maseru	6	6	—
Mafeteng	7	6	1
Mohale's Hoek	10	8	2
Quthing	8	8	—
Qacha's Nek	7	5	2
Mokhotlong	5	4	1
Butha Buthe	6	6	—
Leribe	8	6	2
Berea	9	7	2
Total	66	56	10

(2) In order to prevent unrecorded female cattle entering the territory the following measures were introduced in addition to the existing law to debar "scrub" bulls being brought in:—
 (a) Ports of entry were gazetted. (b) A system of inspection by officers on specified days was introduced, at the authorised ports of entry. Under (a) no cattle are permitted to enter excepting via declared ports of entry.

The Ports of Entry are:—

Maseru Bridge.
 Van Rooyen's Gate.
 Makhaleng Bridge.
 Telle Bridge.
 Qacha's Nek Gate.
 Ramats'eliso's Gate.
 Namahali Pass.
 Caledon Poort Bridge.
 Ficksburg Bridge.
 Peka Bridge.

A culling demonstration was held at Maseru in September, 1938. Traders and speculators are now aware of this precaution governing the introduction of cattle. This measure will undoubtedly protect the Native cattle owner because he will be able to acquire from the trader and speculator a better investment than hitherto.

Emasculation was steadily continued throughout the year on the basis of moral persuasion, and also in accordance with the conditions under which bulls are loaned, and as a result 2,531 undesirable bulls were castrated by members of the Agricultural and Veterinary Staffs as follows:—

By Agricultural Demonstrators 673
 By members of the Veterinary Staff 1,858

These figures do not include many hundreds of bull calves castrated by the owners themselves.

13—SHEEP IMPROVEMENT SCHEME.

During the year under review 290 merino rams were purchased in the Union by the Government and introduced into Basutoland for resale as in previous years to sheep farmers.

The total number of rams thus introduced to date is 1,263. The annual importation and resale of rams will continue. A departure from the procedure adopted in previous years was decided upon and instead of consigning all the rams to Maseru for acclimatisation purposes the 1937/38 batch was split up and consigned to certain camps.

The following is a table showing the distribution of the 1937/38 importation of rams, the mortality from all causes, the number sold and the number on hand on the 30th September, 1938.

Veterinary Area.	Number Received.	Mortality.	No. Sold.	No. on Hand on 30/9/38.
1. Maseru	30	—	30	—
2. Mafeteng	34	—	34	—
3a. Quthing	34	2	32	—
4. Qacha's Nek . .	192	6	186	—
Total	290	8	282	—

The resale price of these rams was fixed at £2 5s. 0d. each. All the sheep when purchased were animals of breeding age and carried long wool. This attracted Native purchasers who realized quite a good sum for the fleece in each case.

During the financial year 1938/39 it is proposed to purchase approximately 600 merino rams and as in the case of those purchased during the previous financial year they will be distributed direct to the various districts. The sheep will be of breeding age and carry long wool, and authority has been granted to acquire a still better class of ram at proportionately higher prices. Authority has also been granted to sell these higher priced rams to the Native farmers at prices lower than cost price. The farmer will, therefore, benefit in a two-fold manner by getting the fleece and also by getting a super-quality ram at a reduced figure.

Elsewhere in this report mention will be made of further measures taken to improve the health and quality of our sheep population.

14—CATTLE (European owned).

The number of European owned cattle in the territory remained practically the same as in the previous year. As these are kept for domestic purposes only, popular milking breeds such as the Jersey, Friesland, Kerry and Shorthorn are favoured.

There are no European farmers, and cattle dipping is not carried out. There are two cattle dipping tanks in the territory viz.:— one at Maseru and one at Qacha's Nek; but these are not in commission at present. Steps are to be taken to repair the Maseru Cattle Tank in order to cope with tick life on the reserve.

The Government owned dairy herd at Botsabelo Leper Institution Farm is now almost predominantly Friesland.

CATTLE (Native owned).

As already indicated, certain measures have been introduced which are calculated to improve the Native herds of Basutoland with regard to milk and beef production and for draft purposes. There is a steady demand for Basuto trek oxen which farmers in the Union hold in high esteem. In some districts in Basutoland there is a dearth of trek oxen, and one often sees mixed spans of oxen, cows and bulls used for ploughing purposes in the fields.

The following table shows comparative figures for the years 1935/36, 1936/37, and 1937/38 in respect of cattle, also imports and exports:—

1935/36.			1936/37.			1937/38.		
Census.	Imports.	Exports.	Census.	Imports.	Exports.	Census.	Imports.	Exports.
414,872	6,995	9,913	418,921	11,746	8,477	434,990	12,073	5,544

A classified cattle census was taken during the year. The following table shows the comparative figures for the years 1936/37 and 1937/38.

1936/37.					1937/38.			
Bulls.	Cows.	Calves.	Oxen.	Total.	Bulls. and Bull Calves.	Cows. and Heifer Calves.	Oxen.	Total.
29,140	183,661	80,075	123,045	418,921	55,134	231,296	148,560	434,990

The ratio of bulls to females is still far in excess of that considered adequate.

Number of hides exported in lbs.: 95,134.

15—PREPARATION OF HIDES FOR THE MARKET.

During the year under review steady propaganda work was carried out with a view to educating the people to "sun-cure" hides, according to the latest approved methods. The pamphlet issued during the previous year was widely circulated and many traders and Native farmers adopted the advice contained therein.

With the exception of hides cured by traders, butchers and the Farm Bailiff at the Bots'abelo Leper Institution Farm, 25% of

hides are still classified as ungradeable. The average quality of the gradeable hides, flayed and cured by Native farmers, is given as follows:—

First quality	35%.
Second quality	15%.
Third quality	15%.

At the present time the vast majority of Basutoland hides are produced from carcasses which are flayed on the veld. The hides are sold by the Native farmers to the local trading centre, and may be cured by sun-drying before selling or, in cases where the trading centre is near by, sold in the green state and cured at the trading centre by salting or sun-drying.

The low quality of hides produced in Basutoland by Native farmers is due mainly to bad flaying, faulty curing and faulty preservation. Other faults which occur are:—

- (a) Horn-rakes.
- (b) Brand marks.
- (c) Whip marks.
- (d) Bed sores.
- (e) Damage from parasitic skin diseases.

16—EXPORTATION OF BONES.

The Basutoland Government has under consideration an application by a Union firm to erect a bone sterilising factory at Maseru.

17—PROPHYLACTIC INOCULATION AGAINST ANTHRAX IN CATTLE.

Owing to the improved position in regard to the incidence of Anthrax, the universal inoculation of cattle carried out in previous years was abandoned. Protective inoculation against this disease is now confined to (i) known infected and contact centres (ii) imports and exports.

All cattle in infected and contact areas are inoculated bi-annually. The Union Government supplies the vaccine at the rate of 5s. per 100 doses. Inoculations are carried out free by members of the Agricultural Department and Basutoland Mounted Police, excepting in the case of traders and livestock speculators importing and exporting cattle, when a charge at the rate of 10s. per hundred doses is made. All cattle entering and leaving the territory are inoculated by Basutoland Government Police Officials immediately prior to entry or exit, and for this purpose crush pens have been erected at the following declared ports of entry:—

1. Maseru.
2. Van Rooyen's Gate.
3. Makhaleng Bridge.
4. Telle Bridge.
5. Caledon Poort Bridge.
6. Ficksburg Bridge.
7. Peka Bridge.

It is hoped in the near future that similar crush pens will be erected at Qacha's Nek Gate, Ramats'eliso's Gate, Bushman's Nek and Sani Pass. During the year 16,700 doses of Anthrax Vaccine were issued to the police at a total cost of £41 15s. 0d.

Only four outbreaks of Anthrax involving the deaths of four cattle were detected during the year as compared with twelve outbreaks during the previous year.

The number of cattle inoculated against Anthrax during the period under review totalled 140,680 units.

18—CATTLE EXPORT AND BARTER TRADE.

(a) Slaughter cattle.

There is practically no export trade in slaughter cattle.

(b) Trek oxen.

As already pointed out many trek oxen leave the territory annually. These are either purchased outright by Union farmers, or by speculators who acquire them by barter. In the latter case tollies are exchanged for oxen on the basis of two tollies to one ox. In this manner quite an extensive trade is done to the detriment of the ox transport service of the country.

19—GENERAL.

As pointed out in previous reports grazing in the lowlands is becoming increasingly limited due to intensive cultivation. There is, of course, plenty of grazing in the highlands where cultivation is not carried out on such an intensive scale. The highlands maintain most of the cattle population during the spring, summer and early autumn, but at certain periods such as the ploughing season the problem in the lowlands becomes acute. During the winter months, due to severe cold and snow in the mountains, the lowlands are flooded with cattle brought back from the highlands, and are entirely dependent upon maize stalks for sustenance.

Fortunately owing to fairly well distributed though not heavy rains during the summer there was good grazing and a fair quantity of maize stalks in the fields and consequently cattle fared well during the winter which was fortunately comparatively mild in the lowlands.

Favourable rains during the months of August and September provided a certain amount of early grazing, and in consequence cattle maintained their condition and there was no mortality from starvation.

The average rainfall for the year was 25.55 inches compared with 35.03 inches during the corresponding period of the previous year.

VELD BURNING AND ECOLOGICAL SURVEY REPORT:

The Ecological Report dealt with damage caused by indiscriminate veld burning and certain suggestions were made for controlling same. The report also recommended certain measures for the control of grazing. Many of the recommendations made were subsequently approved and it now remains to see that these are carried into effect by members of the Administrative and

Agricultural staffs with the assistance of the Paramount Chief and his people. Briefly the recommendations of the Ecological Survey Report may be summarised as follows:—

- (1) The Northern sweet grass slopes to be grazed in winter, and the Southern or sour grass slopes to be grazed in summer.
- (2) Bitter Karroo areas not to be grazed until these have recovered after a period of rest.
- (3) Village grazing areas to be divided into three sections. Two portions to be grazed in summer and one in winter, on a rotational plan.
- (4) Stock distribution to be arranged by the chiefs both for the alternative grazing of sweet and sour veld and the rotational system referred to under paragraph (3).
- (5) Owing to the alternative grazing of sweet and sour veld in the Northern and Southern slopes respectively cattle posts to be duplicated.
- (6) Sweet veld areas not to be burned but that it may be necessary to burn sour veld areas occasionally providing it is impossible to keep the grass down by grazing during the summer months.
- (7) It was laid down as a general practice that steep land in the mountains and semi-mountainous areas are to be ploughed across the slope and that water should be diverted from the higher slopes above such cultivated areas and spread over adjoining grass land, and that grass strips alternating with ploughed strips running on the contour will be introduced as regular agricultural practice.

20—SMALL STOCK.

As a result of favourable weather conditions throughout the year and the compulsory monthly dosing, small stock maintained its condition well. With the exception of "Fluke," the incidence of which is localised and fluctuating, it is hoped that the veld will, in a few more years, be comparatively free from all other forms of internal parasites which invade the alimentary tract, and consequently we anticipate, all things being equal, a still greater increase in our small stock population.

During the year 11,518,613 doses were administered under the compulsory monthly dosing scheme for parasites having the stomach and intestinal tract as their domicile. Many farmers dose their small stock for "Fluke" using Carbon Tetrachloride supplied by the department on payment.

In either case pregnant sheep and very young lambs are not dosed. The former are exempted for two weeks before and two weeks after lambing. Weather conditions very often prevent dosing to schedule and consequently one cannot assume that each unit of small stock is dosed twelve times in a calendar year.

The policy of free dipping for "ked" infested sheep, and small stock exported to the Union was approved. This policy it is hoped will encourage flock owners to dip for "ked" and in the course of time this menace to our sheep industry should disappear.

During the year 21,535 sheep and goat rams were emasculated as follows:—

By members of the Veterinary Staff .. 18,238

By members of the Agricultural Staff .. 3,297

These figures do not reflect those emasculated by the farmers themselves. It will be recollected that through the good offices of the Paramount Chief, who decreed that no undesirable sheep ram should be permitted to pollute his people's flocks, the territory was practically purged of this menace to our sheep and wool industry. Unfortunately, during the year a certain number of recalcitrant owners were brought to book for neglecting to carry out the Paramount Chief's orders holding that there was no legislation to compel them to eliminate bastard sheep rams. As a last resort the Government may have to introduce a law in this connection.

The tables appended show comparative statistics for the years 1936/37 and 1937/38.

	1936/37.	Sheep.	Goats.
Census	1,283,394		411,931
Field inspection	9,775,763		3,030,982
Doses administered for worms	8,825,819		2,935,226
Castrated	9,673		2,975
Dipped	5,249		44
Exported	3,938		102
Imported	7,488		108
Wool exported in lbs. .. .	5,872,791		
Mohair exported in lbs. .. .			783,885
Skins exported in lbs. .. .		63,097	
	1937/38.	Sheep.	Goats.
Census	1,470,361		489,574
Field inspection	9,093,976		3,102,658
Doses administered for worms	8,594,360		2,924,253
Castrated	17,879		3,656
Dipped	9,396		1,451
Exported	1,641		98
Imported	12,507		402
Wool exported in lbs. .. .	5,013,460		
Mohair exported in lbs. .. .			779,980
Skins exported in lbs. .. .		42,625	

WOOL CLASSING SCHEME.

During the year arrangements were made to give wool classing demonstrations in the near future for the benefit of the trading community. All the trading community including Principals, Store Assistants, (Native and European) and Yard Boys will be invited to attend.

The success of these demonstrations will be mentioned in next year's report. The idea is an excellent one as it makes for uniformity and enlightenment.

The Government has received tributes from leading traders not only for the facilities offered them but also for valuable assistance rendered in the past in piloting the scheme to what promises to be a successful issue.

A table is appended showing the quantity of wool classed by officers of the Division, into the various lines throughout the territory during the spring and early summer of 1937 and the late summer and autumn of 1938. The table also shows the number of flocks and the total number of sheep handled as well as other items of general interest.

WOOL CLASSING RETURN.

Spring and Autumn Seasons Combined (for the whole territory).

Various Classes and Weight in lbs.

Veterinary Area.	No. of flocks.	No. of sheep.	Comb-ing.	Shorts.	C. & C. XM.	H.	LL.	L.	BUR.	CHP.	BP.	BKS.	LOX.	Other Lines.	Total Weight in lbs.
Butha Buthe	62	6,394	8,078	6,135	4,528	—	366	—	—	—	3,812	—	1,925	—	24,844
Teyateyaneng	34	2,381	513	2,680	1,698	—	466	277	—	44	927	—	1,127	—	7,732
Maseru	88	4,509	3,628	7,135	2,900	—	381	303	—	91	283	—	3,961	—	18,682
Mafeteng	118	11,871	10,973	15,537	6,816	—	—	153	116	826	8,831	—	6,243	—	49,495
Mohale's Hoek and Quthing	103	12,991	28,250	6,903	6,744	—	1,081	360	353	2,016	6,288	—	8,802	2,506	82,544
Qacha's Nek	81	8,957	8,337	2,719	14,146	—	2,371	437	—	471	2,341	9,241	11,825	MB	52,177
Mokhotlong	19	2,526	4,534	650	4,676	706	817	20	—	—	1,336	—	1,487	RAM	15,171
														474	
Totals	505	49,629	64,313	41,750	41,508	706	5,482	1,550	469	3,448	43,818	9,241	35,371	2,506	250,645

Average No. of sheep per flock	98 sheep.
Average weight per sheep	5.05 lbs.
Average weight clean fleece wool only per sheep	3.19 lbs.
Percentage of combing	29.32%
Percentage of short wool	17.28%
Percentage of C & C + XM	16.56%
Percentage of outsorts	36.84%

The number of sheep dealt with was greater than was anticipated. The progress made was most encouraging. There was a marked decline in coarse and coloured wool, due to the elimination of the bastard ram menace, which has dropped from 35% to about 16% in the last three years. This reflects the greatest credit on all concerned and particularly on all chiefs, headmen and flock owners who obey the Paramount Chief's orders.

In the lowlands particularly, a considerable amount of wool was contaminated with seed and burr, the presence of which adversely affects the price of this product; for this reason strong representations were made to the Paramount Chief in regard to the incidence of noxious weeds in certain areas, and he issued instructions to all chiefs to take strong measures to eradicate infestations particularly of burrweed, cockle burr and spear thistle.

The incidence of steek gras (*Aristida congesta*) is great in certain areas as is the case in many sheep farming areas in the Union. Unfortunately there is no known method of eradicating this grass and therefore the only practical method of dealing with this trouble so as to minimise its adverse effect on the value of the wool is to shear bi-annually and class out the seedy portions of the fleece and mark such wool as seedy; this practice is being advocated and gradually introduced into Basutoland.

21—STOCK THEFT.

Mention was made in previous reports of the incidence of stock thieving and its detrimental effect on our Livestock Improvement Schemes. The activities of the Police during the period under review have, to some extent, checked the evil, and it is hoped the improvement referred to in last year's report will continue and that in the near future the more notorious thieves will be run to earth and further marauding gangs disorganised.

22—PIGS.

Among the Native population pigs are only produced for domestic requirements. There is no Native export trade. A few European traders in the territory produce pigs on a minor scale for export. Apart from internal parasitism, disease among pigs is a negligible factor.

23—POULTRY.

Poultry husbandry is practised on a very small scale. Many European residents and a few progressive Native farmers are enthusiastic, but thieves and vermin materially handicap the progress of the industry.

The incidence of disease, notably Fowl Typhoid, is also a menace, although prophylactic inoculation against this disease has given good results where outbreaks are reported.

24—EQUINES.

A census was taken during the year revealing the following equine population:—

Basuto ponies	37,783
Donkeys	25,314
Mules	1,076

These figures when classified are as follows:—

Stallions	Mares	Geldings	Donkeys	Mules
15,341	45,232	27,215	25,314	1,076

During the year 2,120 equines were castrated.

By members of the Agricultural Staff 262

By members of the Veterinary Staff 1,858

As already indicated there are 32 Government owned stallions and 20 Catalonian "Jacks" standing at stud in the territory for the purpose of equine improvement. The majority of the stallions introduced are thoroughbred and already many foals have been produced. There are far too many "scrub" stallions in the territory but it is hoped that with the lapse of time the majority of these will be eliminated.

The rehabilitation of the Basuto pony to its former standard will soon be apparent because well over a thousand well bred foals should be born next year from mares served and this number will progressively increase as more desirable stallions are introduced year by year and the progeny become available for breeding. The encouragement of mule breeding is a laudable project. There is a great scarcity of mules in Basutoland. However, in a few years, as a result of the Government's policy the mule population should be materially increased. As a result of the dearth mentioned, the Government is often obliged to purchase mules in the Union, and during the year twenty were introduced for pack purposes. Mules are much more economical than horses for pack work being practically self-supporting and do not require shoeing. They can carry heavier loads and have much greater powers of endurance. Besides, they are serviceable up to twenty years of age.

There is an ever increasing demand for donkeys for transport. The demand is caused by the scarcity of trek oxen. Importations, although restricted by law, have latterly been allowed, in the shape of adult geldings, in large numbers to enable traders to transport wool and wheat from the mountain stations to lowland depots. It is universally known that donkeys cannot be acquired in Basutoland from Natives except in very small numbers and even then at considerably enhanced prices. The Native people realize the value of their donkeys and simply will not part with them. During the year 249 donkeys were introduced from the Union mostly by traders. Unfortunately Union donkeys take some time to acclimatise. Up to 8s. per bag of grain is paid for transport from some of the mountain stations.

25—DOGS.

With the exception of those owned by European residents, the dogs of the country can only be described as a heterogenous collection. In certain areas Natives pool their dogs and hunt jackals and other vermin. In a few isolated cases greyhounds are bred for export.

26—EDUCATIONAL WORK.

It is the constant endeavour of the Government to elevate the standard of animal husbandry along livestock improvement lines. Continuous persuasive propaganda and demonstration work is performed concurrently with other duties. A scheme is to be evolved whereby lectures are to be delivered by officers of the department to teachers employed by the Education

Department with a view to intensifying propaganda through the medium of that department. Considerable progress has been secured during the year under review, particularly in connection with the sheep and wool industry.

As a result of our sheep improvement schemes viz.: dosing, elimination of the bastard rams and their replacement by good merino rams, improvement has already made itself apparent, and we are now able to demonstrate to the people, under the extensive wool classing scheme, how best to deal with the improved product from the time it leaves the sheep's back.

27—EXTRANEOUS DUTIES.

Happily the members of the Veterinary Staff were not called upon during the year to render emergency services of a more or less extraneous nature, such as the destruction of locusts or rodents.

28—LOCUSTS.

During the year under review the territory remained free from locusts.

29—CONTRIBUTIONS TO THE PRESS.

During the year the Principal Veterinary Officer contributed a number of articles to the press for publication in English and Sesuto in papers circulating in Basutoland, the object being to disseminate knowledge as widely as possible and to bring information to the doors of the people.

30—PUBLICATIONS.

No publications were compiled during the period under review.

31—CONFERENCES.

No Annual Conference between the Chief State Veterinarians of the High Commission Territories and the Heads of the Union State Veterinary Services took place during the year.

32—ACKNOWLEDGEMENTS.

The grateful thanks of the Division are due to:—

- (a) The Director of Veterinary Services of the Union of South Africa, who has at all times assisted with advice, material and general co-operation.
- (b) Every member of the staff, all of whom performed their duties admirably and zealously.
- (c) The Commissioner of Police and Prisons for valuable services rendered at the ports of entry and exit in connection with the inoculation of cattle against Anthrax, etc.

33—MICROSCOPIC WORK.

The number of smears submitted for the period under review has shown a substantial increase over the previous year.

The following table shows the positive smear return figures for the year:—

Disease.	Bovines.	Canines.	Equines.	Porcines.
Anthrax	4	—	—	—
Anaplasmosis	56	—	—	—
Quarter Evil	18	—	—	—
Piroplasmosis	2	56	16	—

34—TRAVELLING ON OFFICIAL WORK.

To the Union: The Principal Veterinary Officer paid 17 visits to the Union by car and by rail for the purpose of (a) purchasing stallions and Catalonian Jack donkeys, (b) purchasing mules for pack purposes, (c) purchasing oxen for trek purposes, (d) interviewing the manufacturer of the "Dead Cert Remedy," (e) interviewing printers regarding annual report, (f) inspection of bull loaned to Government, (g) judging at Agricultural Shows. In addition to the foregoing eight visits were paid to the Union in connection with the inter-state Veterinary Co-operation Scheme which farmers in the Eastern Free State greatly appreciate, they being very grateful for such services as we are able to render without interference with the Principal Veterinary Officer's official duties in Basutoland. Fees amounting to £20. 6s. 0d. were collected in the latter connection and paid in to revenue.

Within Basutoland: Sixty official journeys were undertaken by car, involving 5,665 miles. No mountain treks were undertaken during the year.

35—LEAVE OF ABSENCE:

The Principal Veterinary Officer was absent on leave from the territory during the month of December, 1937, and part of June, 1938, involving 50 days.

36—AGRICULTURAL SHOWS.

The Principal Veterinary Officer acted as judge in the horse section of the Peka, Teyateyaneng and Masite Agricultural Societies Shows. There were good entries at each show and it was a great pleasure to see the keenness displayed by the exhibitors. With one or two exceptions the exhibits were not of a good standard. Nevertheless, shows are encouraging the horse improvement policy of the Government.

PART II.

DISEASES OF DOMESTICATED ANIMALS IN BASUTOLAND.

37—BACTERIAL DISEASES.

In Cattle: Anthrax; Bacillary Necrosis; Malignant Oedema; Quarter Evil; Scours; Paratyphoid; Vaginitis.

In Equines: Strangles.

In Sheep: Broncho-Pneumonia; Paratyphoid.

In Poultry: Fowl Typhoid.

38—PROTOZOAL DISEASES.

- In Cattle: Anaplasmosis; Piroplasmosis.
- In Equines: Piroplasmosis.
- In Dogs: Piroplasmosis.
- In Sheep and Goats: Nil.

39—VIRUS DISEASES.

- In Cattle: Ephemeral Fever.
- In Equines: African Horse Sickness.
- In Pigs: Nil.
- In Sheep: Blue Tongue.
- In Dogs: Distemper.
- In Poultry: Roup (Avian Diphtheria).

40—MYCOTIC DISEASES.

- In Cattle: Actinomycosis; Ringworm.
- In Equines: Ringworm.
- In Dogs: ditto.
- In Cats: ditto.

41—METAZOAL PARASITES.

- In cattle, equines, pigs, sheep, goats, dogs, cats and poultry.
 - (1) Helminthiasis.
 - (2) Ectoparasites.

42—POISONINGS.

- (1) Vegetable Poisonings;
- (2) Mineral Poisonings.

43—MISCELLANEOUS DISEASES.

- In Cattle: Ophthalmia.
- In Horses: Endemic Cirrhosis; Osteoporosis.

44—ANTHRAX.

Unfortunately it is difficult to accurately determine the incidence of Anthrax in the territory, for the following reasons:—

- (1) Only a small percentage of smears are submitted from animals dying from any cause, but the period under review showed a substantial increase in the number submitted for examination.
- (2) All cattle in infected areas are inoculated bi-annually.
- (3) All cattle intended for import and export are inoculated immediately prior to entry or exit. To facilitate the work no cattle can enter the territory excepting by way of declared ports of entry.
- (4) All calves born in infected areas are inoculated.
- (5) All cattle entering infected areas are inoculated.

The policy of universal inoculation was abandoned and we are now concentrating on infected areas only.

The following table shows the position as reflected in the smear register:

Number of infected areas	3
Number of deaths from Anthrax	4

45—MALIGNANT OEDEMA.

Cases of this disease were reported following injuries, operations, etc.

46—BACILLARY NECROSIS.

A number of cases were reported and appropriately treated.

47—QUARTER EVIL.

This disease is very prevalent in the territory. An increased number of outbreaks were dealt with by vaccination with Blacklegol. Unfortunately owners are reluctant to spend money on vaccine although there is a decided trend towards patronising Blacklegol for the reason that, unlike the Filtrate supplied by the Union Government, it confers a lifelong immunity.

48—SCOURS.

Cases of diarrhoea occur in calves. These are amenable to treatment, and in the case of freshly weaned calves by putting the calves back to suckle. Cases are usually associated with bad hygiene and dietetic errors.

49—PARATYPHOID.

A number of outbreaks were successfully dealt with by Vaccination.

50—VAGINITIS.

This disease is prevalent particularly amongst cattle owned by Europeans.

51—STRANGLES.

Although the disease appears to be recurrent in certain areas very few cases were encountered. All cases dealt with at the Clinic were treated with curative vaccine.

52—BRONCHO-PNEUMONIA.

This disease is almost entirely confined to sheep, and is met with either as a post-shearing occurrence or after vaccination for Blue Tongue, particularly following a cold snap.

53—FOWL TYPHOID.

A number of outbreaks were successfully checked by isolation of infected birds, and preventive inoculation of all contacts.

54—ANAPLASMOSIS.

All Government owned cattle have been immunised against this disease. Unfortunately a breakdown of immunity occurred in a few cases, but all animals recovered with appropriate treatment. The Gallsickness Prophylactic Vaccine used was supplied by the Union Government. The disease is prevalent amongst Native owned cattle, throughout the territory. Unfortunately

the use of vaccine does not universally appeal to the owners because they are not prepared to pay 9d. per head to immunise their animals.

55—PIROPLASMOSIS (Cattle).

Two cases of "Red Water" were diagnosed in oxen; this disease, however, is of very rare occurrence.

56—PIROPLASMOSIS (Equines).

Twenty-five cases of "Biliary Fever" in equines were treated at the clinic and elsewhere. Each patient made an uneventful recovery when treated with either "Piroblue" or "Acaprin."

57—PIROPLASMOSIS (Canines).

Forty cases of "Biliary Fever" were treated at the clinic and practically all recovered after intra-muscular injection of "Acaprin."

58—EPHEMERAL FEVER.

The so-called "Three Days' Sickness" of cattle was reported during the year in certain areas. Happily, it was not responsible for any mortality.

59—AFRICAN HORSE SICKNESS.

One case was reported only.

60—CATARRHAL FEVER OF SHEEP.

The disease was prevalent in certain areas. Despite our advice flock owners are unwilling to resort to preventive inoculation.

61—DISTEMPER.

Only a few cases were brought to the clinic and these were successfully treated with curative vaccine.

62—AVIAN DIPHTHERIA.

No outbreaks of this disease were reported, but I have reason to believe that the disease is fairly widespread.

63—ACTINOMYCOSIS.

"Lumpy Jaw" is fairly prevalent in the territory.

64—RINGWORM.

This disease is not widespread.

65—HELMINTHIASIS.

Almost every conceivable variety of helminth is to be found in livestock in Basutoland. Fortunately, in the case of sheep and goats, the compulsory monthly dosing scheme is gradually eliminating those internal parasites belonging to the Trematoda, Cestoda and Nematoda groups of helminths. In addition to the foregoing, special treatment for sheep and goats infected with "Liver Fluke" (*Fasciola Hepatica*) is resorted to. Many owners bring their horses to the clinic for worm treatment,

66—ECTOPARASITES (Small stock).

The territory has enjoyed freedom from scab for the past six years, and continues to do so. Ked (*Melophagus ovinus*) infestation is prevalent in parts. Many owners requisition for our services, and dip is now supplied free of charge. The Paralysis tick (*Ixodes Rubicundus*) causes mortality in the autumn in the lowlands. *Linognathus Africanus*—the blue louse—is found on sheep. *Bovicola Capra* is prevalent on goats.

Oestrus Ovis — The Nasal Fly is very prevalent and causes mortality amongst sheep, particularly in the lowlands.

Although all varieties of blowflies found in South Africa are encountered in Basutoland they do not appear to menace the sheep industry. The stable fly (*Stomoxys calcitrans*) causes mortality after shearing, particularly in the lowlands during very wet seasons.

67—ECTOPARASITES (Large stock).

Lousiness (pediculosis) is almost universally met with. Lice set up anaemia and skin irritation, causing loss of condition particularly in working animals. Owing to the lack of dipping tanks hand-spraying has to be relied upon. This is a tedious operation. The equine mange position shows definite signs of improvement; 160 cases were treated as compared with 283 last year.

The disease is also met with in cattle, particularly in the region of the head, neck, shoulder and rump.

68—POISONINGS (Vegetable).

No cases of vegetable poisoning were reported during the year.

69—POISONINGS (Mineral).

Cases of arsenical poisoning occurred in donkeys.

70—OPHTHALMIA.

Specific or periodic ophthalmia is rarely met with in calves.

71—ENDEMIC CIRRHOSIS (Grass Staggers).

Regionally this disease is confined to the highlands and subjectively to aged horses. It is known to the Natives as "Hlohoana." On the northern and eastern slopes of the Maluti the incidence of Senecio is most marked because this aspect favours its growth. Comparing the mortality in Basutoland from this disease with that of parts of East Griqualand, across the border, one can be assured that "Grass Staggers" does not constitute as grave a menace to horsebreeding in Basutoland as people imagine. The reason being that in East Griqualand all farms are paddocked and consequently there is intensive grazing whereas there are no fences in Basutoland.

72—OSTEOPOROSIS.

"Bone Disease" as it is called, is rather common in the lowlands and is due to feeding too heavily on maize. Its etiology has recently been traced to that cause.

PART III.

MEASURES TO BRING ABOUT BETTER IMPROVEMENT OF LIVESTOCK.**73—CATTLE.****(1) HEALTH IMPROVEMENT MEASURES.****(a) By preventive inoculation.****(i) Anthrax.**

Elsewhere in this report mention is made of the measures taken to prevent Anthrax.

(ii) Anaplasmosis.

All Government-owned cattle in the territory were immunised against Anaplasmosis in 1936. All replacements and fresh purchases are similarly treated.

(iii) Quarter Evil.

Only a few owners avail themselves of the services of the Division to inoculate their cattle.

(b) By Legislation.

With the exception of Anthrax, no internal compulsory measures are in force to deal with cattle disease by preventive inoculation.

(c) By Better Husbandry.

The more progressive cattle owners have heeded our advice in this connection.

(2) QUALITY IMPROVEMENT MEASURES.**(a) By Voluntary Emasculation.**

As will be seen elsewhere in this report, many undesirable bulls have been emasculated by members of the Agricultural and Veterinary Staffs, on the lines of moral persuasion.

(b) By the introduction of suitable sires.

The introduction by the Government of sires of approved breeds under the new Cattle Improvement Scheme, will assuredly give a fillip to our cattle industry.

(c) By Legislation.

A law exists prohibiting the introduction of "scrub" bulls. All cattle presented for introduction are subjected to rigid inspection and "culling."

74—SMALL STOCK.**(1) HEALTH IMPROVEMENT MEASURES.****(a) By preventive inoculation.**

With the exception of Quarter Evil, the only preventable disease met with in Basutoland is "Blue Tongue" (Catarrhal Fever). Unfortunately, the

people generally do not realise the value of preventive vaccination, and consequently very little is done in this connection. It is hoped that, as a result of more intensive propaganda, the seasonal mortality from this disease will diminish.

(b) By Legislation.

(i) Internal Parasites.

The law compelling owners to dose their small stock at monthly intervals, with a remedy approved by the Principal Veterinary Officer, has been eminently successful and already a marked improvement in the health of the small stock is apparent and their number has materially increased.

(ii) Acariasis.

Legislation is in force to deal with scab in sheep and goats, but owing to the freedom of the territory from this disease for the past six years, it is not enforced.

(c) By Voluntary Request.

Many owners have their sheep dipped for ked; all such dippings are carried out under official supervision.

(2) QUALITY IMPROVEMENT MEASURES.

(a) By elimination of undesirable rams.

It will be remembered that through the instrumentality of the Paramount Chief, who decreed that all undesirable sheep rams in the territory had to be emasculated, a state of almost complete freedom from this menace reigned for about two years. Unfortunately, during the period under review, it was necessary to deal with a small number of owners who allowed bastard rams to reach maturity.

(b) By the introduction of suitable Merino rams.

In order to replace the unsuitable rams mentioned under (a) the Government has continued the policy of introducing suitable flock rams, and up to the 30th September, 1938, 1,263 such rams have been imported from the Union.

The 1937/38 importations were distributed direct from the breeders to the various camps and the animals sold readily because they were in full fleece and remunerative prices were subsequently obtained by the purchasers for the wool.

(c) By Legislation.

Amending legislation was introduced in 1928 prohibiting the introduction of Persian and Bastard sheep, and certain types of goats. During the year under review the law was amended to permit the introduction of Swiss goats in addition to Angora goats.

(d) By Better Husbandry.

The Division's activities in this direction are unceasing, and success has attended its efforts. The dissemination of knowledge, through the medium of pamphlets written by members of the staff, has been very much appreciated; the demand for these publications exceeded all expectations.

75—WOOL.

Mention was made in last year's report of the measures taken to ensure the proper preparation of wool for the market. As a result of the sheep improvement scheme already outlined, there is undoubtedly a marked improvement in the quality of the wool, and as time progresses the product will show a still greater improvement and be a great credit to Basutoland. The eight stationary shearing sheds mentioned in last year's report were well patronised, and it was found necessary, in order to cope with the work, to increase the number of portable sheds operating in the uplands from sixteen to twenty-three.

During the shearing season, viz., October—April, over 250,000 lbs. of wool were handled under official supervision. This figure represents quite a fair percentage of the entire wool clip of the territory. Unfortunately, owing to the unsettled state of the international position, the wool market is still unsteady, with downward fluctuations in prices which has made the position difficult for buyers and disappointing for producers. In addition to the increased number of portable sheds, it was found necessary to augment the staff of Native Learner Classers, as it is anticipated that the poundage of wool classed under official supervision next season will show a considerable increase over the previous year. As explained in last year's report, the objects of the wool classing scheme are to (a) establish definite lines of the product on the market, which lines it is hoped, in the course of time, will become well known in the buying trade; (b) teach the farmer how to class his wool and thereby get better prices for the product; (c) induce traders to pay better prices by differentiating between classed and unclassed wools and thus increase the spending power of the people. Generally speaking, reports from coastal houses on the quality of the wool were satisfactory.

76—EQUINES.**(1) HEALTH IMPROVEMENT MEASURES.****(a) By Legislation.**

Outbreaks of equine mange are promptly dealt with when notified.

(b) By Inoculation.

With the exception of the three following diseases—African Horse Sickness, the visitations of which are periodical in the lowlands; Strangles; and very occasional cases of Anthrax—horses are not exposed to any disease which can be prevented by inoculation.

(c) By Voluntary Request.

Many owners dose their horses periodically for internal parasites. For the payment of a fee of 1/- Native-owned animals are treated at the Clinic.

(2) QUALITY IMPROVEMENT MEASURES.**(a) By Voluntary Emasculation.**

Most owners are only too willing to have their undesirable sires emasculated, and, as will be seen elsewhere in this report, many such animals have been castrated by members of the Agricultural and Veterinary Divisions.

(b) By the Government Stud.

The Government Stud at Maseru is well patronised.

(c) By Legislation.

Legislation to restrict the importation of donkeys is in force.

(d) By State Subsidization.

Mention is made elsewhere in this report of an equine improvement scheme which the Government has launched.

(e) By Better Husbandry.

The more progressive horse breeders benefit by advice given them by officers of the Division.

77—NEW LEGISLATION.

The following legislative measures were introduced during the year:—

Proclamation No. 74 of 1937.—To permit the introduction of Swiss Goats.

Proclamation No. 36 of 1938.—Further amending the Basutoland Anthrax Proclamation (No. 7 of 1921).

High Commissioner's Notice No. 128 of 1938.—Prescribing the ports of entry at which cattle shall enter Basutoland.

High Commissioner's Notice No. 121 of 1938.—Designed to prevent the introduction of Foot-and-Mouth Disease.

PART IV.**FINANCIAL STATEMENT.**

Revenue.	Expenditure.
£332 2s. 9d.	£19,374 7s. 6d.

The period covered is from 1st October, 1937, to 30th September, 1938, while the financial year for which the expenditure is given is from 1st April, 1937, to 31st March, 1938.

G. T. HENDERSON,
Principal Veterinary Officer.

AGRICULTURAL DIVISION.

STAFF.

EUROPEAN:

Original Staff:

- L. F. Wachter, M.B.E., Agricultural Officer, Maseru.
 H. C. Mundell, Agricultural and Livestock Officer, Maseru.
 L. H. Collett, Agricultural and Livestock Officer, Maseru.
 C. L. F. Peachy, Agricultural and Livestock Officer, Mafeteng.
 A. E. Hensley, Agricultural and Livestock Officer, Leribe.
 C. H. Aitchison, Agricultural and Livestock Officer, Butha Buthe.
 F. O. A. Wande, Agricultural and Livestock Officer, Peka.
 R. K. Tennant, Agricultural and Livestock Officer, Mohale's Hoek.

NEW APPOINTMENTS:

- B. P. Harding, Agricultural and Livestock Officer, Quthing.
 Date of appointment: 1/12/37.

NATIVE:

The Paramount Chief's Burrweed Inspector.

26 Agricultural Demonstrators; these men are distributed as follows:—

Maseru District	6	Demonstrators.
Mafeteng District	3	„
Mohale's Hoek District	2	„
Quthing District	3	„
Qacha's Nek District	4	„
Mokhotlong (Sub-district)	1	„
Teyateyaneng (including the Peka area of the Leribe District)	2	„
Leribe District	3	„
Butha Buthe District	2	„

NATIVE STAFF CHANGES:

Cross transfers were made between the demonstrators of Peka and Qacha's Nek.

Agricultural Demonstrator D. Ntlaloe, of Semonkong, was replaced by M. Mpela. S. Selo, of Seetsa's, resigned, and his position was filled by E. Lefothane.

C. Leshuta was transferred from Mashai to Maseru, where his work is to advance in every possible way the vegetable gardening campaign.

All demonstrators have now been placed under the direct supervision of the Agricultural and Livestock Officers and Assistant Agricultural and Livestock Officers (Veterinary Division). The demonstration work is being carried out in an efficient manner, especially with regard to vegetable growing. It is, however, impossible to give the agricultural side of the demonstration work as much supervision as one would like to, owing to the many duties which these officers have to perform.

During the period under review, Mr. L. H. Collett was absent for five months in the United States of America, having obtained a Carnegie Scholarship to study the methods adopted in that country to combat soil erosion.

Mr. L. F. Wachter, Agricultural Officer, was absent for six months on Home Leave. During his absence his duties were carried out by Mr. H. C. Mundell.

PART II.

GENERAL AGRICULTURE.

AGRICULTURAL AND WEATHER CONDITIONS.

The weather conditions for the period covered by this report were, on the whole, not nearly as favourable for crop production as those for the previous year. This was especially the case in the lowland districts of the territory.

The advent of the spring rains was much later than usual which, coupled with a dry winter, was responsible for the complete failure of the lowland wheat crop. Planting of the spring crops was carried out in many instances too late, resulting in the crops being frosted before reaching maturity. Weather conditions in the foothills and mountainous parts of the territory, however, were far more favourable to crop production, and excellent crops of wheat and other grain were obtained. In practically all districts throughout the territory the growing period was free from unseasonable frosts.

The first frost which was responsible for the stoppage of all growth occurred on the 28th April. On the whole the winter was milder than usual, with the exception of August, when up to 12 degrees of frost was registered; 10 degrees of frost was also recorded on the 13th September, which was responsible for considerable damage to the setting fruit crop.

MONTHLY RAINFALL FOR THE DISTRICTS AND SUB-DISTRICTS:
1937-1938.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	TOTAL:
Maseru	0.89	4.11	2.37	3.34	6.94	1.24	3.82	0.57	1.01	0.35	0.55	0.36	25.55
Mafeteng	0.41	1.40	2.75	3.49	5.65	0.98	4.23	0.45	1.20	0.60	—	1.34	22.50
Mohale's Hoek	0.50	0.76	3.92	4.02	5.36	1.83	4.11	0.57	1.36	0.42	0.69	0.25	23.79
Quthing	2.26	0.99	2.76	3.04	6.79	1.99	2.86	0.79	2.32	0.29	0.89	0.48	25.46
Qacha's Nek	0.83	1.10	5.44	8.57	6.53	1.43	3.00	0.20	1.37	1.07	1.34	1.04	31.97
Mokhotlong	1.42	1.96	2.67	5.13	3.43	0.86	2.90	0.06	0.58	0.87	1.49	0.75	22.12
Teyateyaneng	1.56	3.90	2.47	4.82	5.02	0.67	2.69	0.59	0.89	0.52	0.79	0.52	24.44
Leribe	1.60	1.72	3.72	5.71	8.10	0.61	3.56	1.06	1.54	0.27	1.73	0.84	30.46
Butha Buthe	1.99	1.85	2.99	7.63	7.38	0.20	2.14	1.12	2.26	0.30	3.00	1.85	32.71
Botsabelo	0.94	3.45	2.70	4.72	6.92	1.03	4.04	0.63	0.63	0.36	0.92	0.28	26.62
Makhalanyane	0.86	3.10	3.73	2.67	6.61	1.06	5.10	0.82	1.60	0.58	0.53	0.73	27.39
Sehlabathebe	1.37	2.70	4.46	5.63	3.73	1.09	2.86	0.05	0.65	1.15	—	0.91	24.60
Roma	1.29	3.50	5.29	4.41	6.19	0.87	4.29	0.72	1.39	0.49	1.09	0.76	30.29

REPORT ON THE CONDITION OF THE CHIEF AGRICULTURAL CROPS, 1937/38.

WHEAT:

The lowland wheat crop was practically a failure due to an exceptionally dry winter and spring.

The mountain and semi-mountain wheat crops were very good, coming up to the standard of the previous year. A considerable portion of the grain is still in the mountains owing to the difficulties encountered in obtaining transport to remove it to the lowlands for sale. There was very little damage to the crops by rust and waterlogging.

PEAS:

A large acreage of peas was sown in the mountain districts and an excellent crop was reaped, a considerable proportion of which will be consumed locally.

BARLEY:

Good crops were harvested. Barley is a useful crop in the highlands, as it can be sown later than any other. It is generally used for horse feed, but is becoming more popular for human consumption.

BEANS:

This crop is grown in the lowlands where late frosts do not generally occur as is often the case in the mountain districts. The acreage of beans was larger than usual owing to these being planted to replace other spring crops which had not germinated. The crop was poor with the exception of Cow Peas or Kaffir Beans. Much damage was done by rust and by the C.M.R. Beetle attacking the bloom.

MAIZE AND SORGHUM:

The crop and quality of maize and sorghum was poor; this was chiefly owing to late planting and to damage by frost before the grain had matured. The crops of these two cereals were better in the foothills and semi-mountain districts of the territory, where the weather conditions were much more favourable.

INCIDENCE OF INSECT PESTS:

The period under review has not been as free from insect pests as the previous season, due to the dry spring and the consequent slow growth of the crops. No swarms of Brown or Red-winged Locusts occurred anywhere in the territory.

No reports of any damage done by the elegant grasshopper were received. This grasshopper seems to have practically died out during the last two years, and in places where swarms were seen every year, only solitary specimens are now observed.

CUT-WORMS:

Considerable damage was done by this pest to the young maize and sorghum during the early part of the season.

MAIZE STALK BORER:

Considerable damage was done to the young maize planted during the beginning of November. Some lands were entirely spoilt. Very little damage was done by this pest later in the season.

THE C.M.R. BEETLE:

This insect was responsible for much damage to the bean crop; the beetles eating the flower of the bean plants.

**ESTIMATES OF AGRICULTURAL PRODUCTION FOR 1938
AND THE PRECEDING YEARS.**

Crop.	1934	1935	1936	1937	1938
Maize	405,974	513,663	491,114	1,135,983	873,750
Sorghum . . .	202,987	194,498	184,179	297,117	197,812
Wheat	152,240	259,331	245,572	383,645	257,812
Peas, Beans & other crops	50,746	64,833	61,393	148,558	109,218

These crop returns are given in bags of 200 lbs.

The explanation of the much larger crops recorded in 1937 is as follows:—

In 1936-37 an Ecological Survey was carried out, and observations made, both in the lowlands and mountain districts, disclosed the fact that a larger area was cultivated than had hitherto been estimated. It is now estimated that 10 per cent. (750,000 acres) are cultivated in a normal year as against 6½ per cent., which was the previous estimate.

This increased acreage, plus a very good season for crop production, is largely responsible for the considerable increase in the estimated crop production for 1937.

The increased estimated production for 1938, over the years preceding 1937, is accounted for, to some extent, by the larger acreage under cultivation and not by favourable weather conditions, as the 1938 season was certainly not as suitable for crop production, particularly in the lowlands, as 1937.

AGRICULTURAL ASSOCIATIONS:

(Farmers' Associations, Co-operative Societies and Native Women's Vegetable Gardening Associations.)

Agricultural Associations: During the previous season there were 59 Associations, viz.: 22 men's, 24 women's and 13 combined Associations. On the 30th September, 1938, there were 101 Associations, which is an increase of 42. The Men's Associations remain about the same. There is, however, a considerable increase in the Combined and Women's Associations, and the primary interest of these is vegetable gardening. The following table shows the position as it is to-day:—

NUMBER OF AGRICULTURAL ASSOCIATIONS IN THE TERRITORY.

District.	Associations.		Com- bined Assocs.	Total No. of Assocs.	Total No. of Members.
	Men's	Women's			
Maseru	7	20	7	34	760
Mafeteng	—	—	13	13	473
Mohale's Hoek	4	—	6	10	213
Quthing	2	5	—	7	199
Qacha's Nek	4	5	—	9	286
Mokhotlong	1	1	—	2	40
Teyateyaneng	—	—	1	1	36
Leribe (including sub-districts of Peka and Butha Buthe)	5	6	14	25	650
Totals	23	37	41	101	2,657

NATIVE (MEN'S) FARMERS' ASSOCIATIONS:

The formation of these associations is often very disappointing, in that many of them start off with a great flourish and function well while they are receiving direct guidance from the Government, but lose keenness when their members have to manage their own affairs. A number of the associations are, however, doing really good work and greatly assist the Agricultural Officers by promoting better agricultural methods in their districts, viz., by the running of agricultural shows and stock and produce sales; by the purchasing co-operatively of vegetable seeds, agricultural implements, fertilizers, etc., etc. Amongst those which are carrying out this good work may be mentioned the Associations at Mafeteng which have expended £61 9s. 7d. on buying implements, seed and fertilizers.

The Peka Association was successful in obtaining a Government contract for the supply of 240 bags of maize.

NATIVE WOMEN'S AND COMBINED ASSOCIATIONS:

The formation of these associations has again made good progress. These associations are responsible for great keenness in the starting of vegetable growing, and are also a great help to the Agricultural Officers and Demonstrators in furthering this project, which is rapidly becoming popular among the Basuto, who are learning that in times of shortage of grain the family garden plays a most important economic part in the supply of food and a change of diet. Many of the Associations have substantial cash balances deposited in the Post Office Savings Bank, and their finances are now well managed.

MARKETS FOR STOCK AND NATIVE PRODUCE:

Vegetable and produce sales have been held weekly at Teyateyaneng, and fortnightly at Maseru, Mafeteng, Mohale's Hoek, Quthing, Leribe, and Butha Buthe, chiefly for the disposal of surplus vegetables.

In spite of the adverse weather conditions experienced during the early part of the season, good supplies of vegetables were forthcoming and the markets were well patronised. No difficulty was experienced in disposing of the produce at remunerative prices.

The Agricultural Associations assist in the running of these markets. The Maseru market has been properly organised and is managed by the Association, and small market dues are paid. The Association has assets of £8 5s. 0d. banked towards the erection of a market shelter, together with tables on which to exhibit the produce. Such shelters already exist at Leribe and Mafeteng.

As the quantity of vegetables offered for sale increases, it is hoped that the local hospitals will be able to buy most of their requirements from the markets.

STOCK SALES:

Sale pens have been erected at the following places: Mafeteng, Maseru, Peka and Leribe. Arrangements have been made for sales to be conducted at these centres during the months of September, December, February and May. A test sale held at Peka proved a success.

AGRICULTURAL SHOWS:

During the period under review Agricultural shows were held at Leribe, Peka, Teyateyaneng and Masite. These shows were conducted by the local Farmers' and Women's Associations, and were assisted by advice from the Agricultural Officers and Demonstrators. Prize money was raised by subscriptions and by Government grants of £10 to each show.

The policy of the Government with reference to agricultural shows is that the Basuto, through their associations, are to be responsible for the running of these. They are to raise the necessary prize money for the different classes by subscriptions amongst themselves. Help in the form of advice from Government officers and the provision of Judges, where required, as well as assistance, on the pound for pound principle up to £10. is provided by the Government. This money is to be spent on prizes for encouraging the Government's agricultural projects. It is thought that this system will induce far more interest being taken in the agricultural shows than has been the case in the past, when the Government gave a substantial grant which covered a long prize list.

The following are some particulars of the shows held:—

Leribe Agricultural Show. The organisation of this show was disappointing, as was also the cattle section. The produce section was good, especially the classes for dry beans and vegetables.

Peka. Although the produce section was not up to the standard of last year, the vegetable section was outstanding. The total number of entries was 410.

Teyateyaneng. The cattle shown were of the Afrikander type, and there was a good entry in this class. The total number of entries was 376.

Masite. A very successful show was held, there being 260 entries in the seven classes. The produce and vegetable sections were particularly good.

ECOLOGICAL SURVEY OF BASUTOLAND:

A most comprehensive and valuable report by Messrs. R. R. Staples and W. K. Hudson has been published on the work of the Ecological Survey.

Some of the recommendations made, such as the laying down of grazing experiments, have been proceeded with. The enclosures for this purpose on the Maseru Reserve are completed. Unfortunately it has, up to the present, been impossible to fence the plots at Mokhotlong, due to difficulties in obtaining pack animals for carrying the great weight of fencing material across the mountains. The pasture enclosures at Thaba Putsoa and Thaba Tsoeu were inspected in January, 1938, and counts were taken of the number of Bitter Karoo bushes (*Chrysocoma tenuifolius*), which had survived in the pegged quadrats situated in each of the enclosures.

These quadrats were pegged out in 1935, and a count of the number of Bitter Karoo bushes in each quadrat was taken. The last occasion on which counts were taken during the period covered by this report was January, 1938. It is also necessary to mention that enclosure No. 1 has been burnt off once and enclosure No. 2 twice. Neither enclosure has been grazed since 1935. The following are the number of bushes in each quadrat, situated in both pasture reclamation enclosures, when the counts were taken in 1935 and 1938:—

No. 1.				1935	1938
Thaba Putsoa	Enclosure	Quadrat	No. 1	60 bushes	21 bushes
"	"	"	No. 2	55 "	24 "
"	"	"	No. 3	23 "	13 "
No. 2.					
Thaba Tsoeu	Enclosure	Quadrat	No. 1	51 bushes	Nil
"	"	"	No. 2	43 "	Pegs removed
"	"	"	No. 3	18 "	3 bushes
"	"	"	No. 4	28 "	4 "

Thus the results obtained up to the present in the eradication and control of *Chrysocoma tenuifolius*, by proper pasture management or burning, are most interesting, indicating that by resting pasture infested by Bitter Karoo, and by judicious early spring burning, from two to three times, this pest can be controlled.

A general rotational grazing policy for the Government Reserves has been agreed upon, and the District Commissioners have been advised.

RODENT DESTRUCTION:

Although in some districts there was evidence of the breeding up of rodents, the situation was not so serious as to warrant the wholesale co-operation of the Agricultural Department, as was the case two years ago. The matter has been ably dealt with by the Medical Department's Rodent Inspector, who has issued poisoned wheat direct to the people, where necessary, and in other cases to demonstrators for re-issue. Two serious outbreaks of gerbilles in the mountain areas were successfully dealt with by the co-operation of the Assistant Agricultural and Livestock Officers with the Rodent Inspector.

LECTURERS AND VARIOUS DEMONSTRATIONS:

The Agricultural and Livestock Officers, the Assistant Agricultural and Livestock Officers and the Demonstrators, have availed themselves of every opportunity to lecture on the various Government Schemes for the general improvement of Native agriculture.

Special care has been taken to teach as many people as possible the benefits to be derived from the growth of vegetables.

Many demonstrations have been given all over the territory by Officers and Demonstrators on the following subjects:--

(1) The right method of terracing gardens, furnishing a water supply and the making of compost pits and compost.

(2) The proper method of ploughing between the contour banks which have been erected in connection with the soil reclamation campaign.

(3) The planting of fruit and forest trees.

(4) Livestock improvement and many other subjects.

The Demonstrators stationed at Mission Stations continue to give lectures and demonstrations, chiefly on vegetable growing, to the students of those institutions, besides carrying on their other district demonstration work.

The following is a list of the total number of lectures given by the Agricultural Officers and Demonstrators. The list also shows the number of Native Farmers who attended:—

Agricultural Officers.	No. of Lectures.	Number Present.
L. H. Collett	32	880
N. O. Halse	86	2,464
G. R. Chalmers	20	750
R. K. Tennant	22	886
L. F. Peachy	10	1,608
P. M. Wilhelm	41	4,128
A. E. Hensley	16	1,728
F. O. A. Wande	9	529
G. H. Larkan	5	850
TOTALS	241	13,823

Demonstrators: District.	No. of Lectures.	Number Present.
Leribe and Sub-Districts	39	2,210
Butha Buthe	57	2,773
Teyateyaneng	6	124
Maseru	83	1,500
Quthing	142	1,503
Mafeteng	42	1,561
Mohale's Hoek	91	1,004
Qacha's Nek	30	514
Mokhotlong	15	892
TOTALS	505	12,081

REPORT ON WINTER AND SUMMER CEREAL EXPERIMENTAL WORK, GRASS PLOTS AND SEED MULTIPLICATION LANDS.

WINTER CEREAL WORK:

Weather conditions were again very unfavourable to the cultivation of wheat, which suffered from drought and a severe attack of the wheat louse *Toxophora graminum*. The majority of the dryland plots and all the later plantings under irrigation were a complete failure.

Of the imported Canadian varieties, "Reliance," "Red Bobs," "Ceres," "Marquis" and "Reward" showed great promise again this season, as they produced good yields which had every appearance of excellent quality. Of the local varieties "Birdproof" and "Lalkasawali" were outstanding, both from the point of view of yield as well as of quality.

SUMMER CEREAL WORK:

Although the first rains only fell during November, the season thereafter was favourable to the growth of Summer cereals at the experimental station and good results were obtained, particularly from the sorghums. The maize results were adversely affected by an attack of cob-borer grub.

A further six early maturing varieties of Sorghum were introduced from Swaziland. These early maturing Swaziland varieties, being five to six weeks earlier in ripening than our earliest local varieties and producing relatively good yields, are likely to be of great value to a cold, short season territory like Basutoland.

GRASS PLOTS:

The more promising varieties, such as *Digitaria scalarum* and *Paspalum notatum*, *Poa binata* and *Agrostis tenuis*, were planted out in order to test their relative usefulness for grassing contour banks, but as this was only done late in the season, it is impossible, at this stage, to judge their suitability or otherwise for this purpose.

Seventeen varieties of *Melilotus* or sweet clover have been introduced from Canada for testing during the coming season. It is hoped that some of these may prove suitable for planting on contour banks in cultivated areas.

SEED MULTIPLICATION LANDS:

(i) "Verneys Land" was used as follows:

A pea field test was carried out. An acre of each of the following varieties of peas was planted: "Basutoland Yellow," "Blackeyed Susan" and "Yorkshire Hero." The last mentioned variety suffered severely from drought and was a complete failure. "Blackeyed Susan" produced three bags of seed, and "Basutoland Yellow," a very much later variety, produced six bags of seed.

(ii) Leper Settlement Field.

Two varieties of sorghum, namely, "Makanya" and "Swaziland Strain" were planted on this field. It was, however, only possible to plant the seed late, and "Makanya," which was a magnificent stand, did not mature fully, but

four acres produced 18 bags of mature and 6 bags of un-mature seed. "Strain 2" matured fully, and from an excellent stand of four acres produced 19 bags of good seed and 3 bags of inferior seed.

REPORT ON THE GOVERNMENT SCHEME FOR THE SUPPLY OF SUPERPHOSPHATE TO THE NATIVES AT COST PRICE.

The results of this scheme have not come up to expectations, as a number of people buy direct from the fertilizer companies, as by doing so they can obtain credit.

The Agricultural Officers and Demonstrators continue to advertise the scheme, and are always ready to advise on the amount of fertilizer necessary for any field, and to actually sow the manure themselves. The scheme under trial at Mafeteng, whereby the Government buys and stores the superphosphate and sells it direct to the Natives as it is required, has been responsible for the selling of 35 bags on repayment, chiefly to the Mafeteng Farmers' Association.

Extensive propaganda will be continued among the Basuto to foster interest and to induce them to buy more fertilizer, both for the production of grain and vegetables. Each Demonstrator was issued with 5 bags of superphosphate for demonstration work in his area.

The African Explosives and Industries Ltd., have very generously presented 8 Silver Cups, which are to be competed for throughout the territory, for the best worked plot in each district which has received a dressing of artificial manure. Messrs. Fisons & Co. Ltd., have also given 4 bags of fertilizer for trial in Basutoland. The Peka and Teyateyaneng Farmers' Associations were given two bags respectively, and will each treat a two acre plot and work it co-operatively. A total amount of 416 bags of superphosphate was bought by the Basuto during the year 1937/38, as against 507 bags of superphosphate and 24 bags of complete fertilizer in 1936/37.

The amount purchased was made up as follows:—

	Superphosphate
Bought through the Mafeteng Scheme ..	35 bags.
Bought through the firms supplying artificial manure ..	291 bags
Bought through the Government Scheme ..	90 bags
	416 bags
TOTALS	41.6 tons

In Basutoland superphosphate is generally broadcasted at the rate of 200 lbs. per acre, although some of the more advanced Natives are now buying planters with fertilizer attachments. The fertilizer bought is generally used for the production of maize and sorghum, but the amount used for vegetable gardens is increasing annually.

Although the quantity of superphosphate purchased during the period under review is less by 91 bags than that obtained in the previous year, the large number of ocular demonstrations provided by 416 bags should act as incentive to Natives to buy fertilizer.

PRODUCTION OF STRONG WHEAT IN BASUTOLAND:

It has been proved by numerous milling and baking tests that the soil and climatic conditions of Basutoland are favourable for the production of strong wheat of the same quality as "Manitoba Strong." It is also a known fact that many of the weaker wheats improve considerably in milling and baking qualities when grown in Basutoland.

An article has been written and published on the production of strong wheat in this territory, giving the history of introductions and particulars of milling and baking tests carried out by the Imperial Institute, Milling Companies and the Elsenburg-Stellenbosch University, on a number of local and introduced varieties of wheat; also the history, up to date, of all that the Administration has done to improve the quality of Basutoland wheat.

Of the varieties of wheat introduced into the territory, undoubtedly "Manitoba" (Marquis) has proved the best, and has produced samples equal in strength to the best imported "Manitoba." In view of this information a number of wheats from Canada were imported and tested on the Summer Cereal Experimental Plots as to their suitability for growth in Basutoland. "Marquis," "Ceres," "Red Bobs," and "Reliance" at present show the most promise. They are being tried out in field plots against a local variety during the coming season.

Owing to the almost total failure of the lowland crop, the stock of "Manitoba" wheat in these districts will be seriously reduced. Good crops, however, were grown in the mountain districts where there are many growers of this wheat, over and above those who have received issues of seed from the Government. The traders realize the value of this wheat, and keep back many parcels of good "Manitoba" in order to resell this as seed.

A crop of 528 bags of "Manitoba" wheat was grown in 1937/38, by Native growers who had received government issues of seed.

REPORT OF THE GENERAL AGRICULTURAL DEMONSTRATION WORK CARRIED OUT IN THE TERRITORY DURING 1937/38.

The demonstration work carried out during the period under review was well done, and in most instances was outstanding. In some cases, however, the work which was carried out early in the season (which at that period was very dry) was spoilt by attacks of cut worm and mealie stalk borer.

In the lowlands the wheat crop was an entire failure and the lands were re-ploughed and sown to maize and beans. These fields and those which received good cultivation were the only lands which produced fair crops. These demonstrations are slowly making the Basuto realize that the correct methods of agriculture are the only ones which pay, consequently the demand for the help and advice of the demonstrators is increasing so rapidly that it is impossible for the present staff to cope with the work.

The Agricultural Demonstrators are still undertaking much useful agricultural demonstration work, but their services are now required far more than hitherto in the vegetable growing

campaign which is being pushed forward all over the territory. They are carrying on excellent work in this direction, as can be seen by the numerous well stocked terraced gardens all over the country. Demonstrators also co-operate with the Veterinary Section in every possible way regarding the elimination of undesirable sires of all types of stock, etc.

The particulars of all the demonstration work undertaken, appear in tabulated form in the annexures to this report.

During the spring of 1937, the following seeds were issued for demonstration purposes:—

- 10 bags Cow Peas — Whippoorwill.
- 14 „ Anveldt Maize.
- 17 „ American White Flint Maize.
- 8 „ Boesman Maize.
- 15 „ Mazena Bread Maize.
- 5 „ Seven Year Beans.
- 6 „ Peas.
- 10 „ Pea Nuts.
- 4 „ Seed Potatoes.

Seed is issued to approved Native farmers on the understanding that a similar amount of selected seed will be returned to the District Agricultural Officer after the harvest, for re-issue during the following season. Owing to the bad agricultural season there were many crop failures and consequently the amount of seed returned was small.

The Administration is most anxious to improve the diet of the nation, and in order to foster this idea, has inaugurated a competition and is giving prizes to encourage:—

(i) the improvement and increased production of field crops, such as maize, sorghum, wheat, standard legumes and heavy oil bearing legumes, e.g. pea nuts;

(ii) better all round methods of cultivation of the chief crops grown in the territory;

(iii) the growth of a greater range of crops, especially more legumes; this will make it possible to introduce better crop rotations;

(iv) Agriculturists to take the trouble to grow pure strains of the various crops and to select good seed and become seedsmen themselves, from whom the ordinary native farmer could obtain good acclimatised seed, thereby keeping the money circulating in the territory.

A sum of £50 was allocated for prizes in the Crop Competition; £18 was actually expended.

The competition was divided under three headings which were made up as follows:—

Class A. The free distribution of seed under certain conditions.

Class B. Small cash prizes to be awarded for Field Competitions covering all operations in the production of these crops.

Class C. Field Competitions for the production of high class seed of the most desirable variety of any particular crop.

The Administration proposes to help the seed producers by buying as much of the Government requirements of high quality seed from them as possible, and by paying up to 5s. more per bag of 200 lbs. than the price of commercial grain.

Under Classes B. and C a first prize of £1 is given for the best field in each Demonstrator's district. If there are 15 or more entries a second prize of 10/- is given.

The following scale of points was drawn up to act as a guide when judging Class "B."

1. **Preparation.**—Ploughing (winter or otherwise) must be done across the slope, and on the contour where the land slopes more than one way. It is comparatively easy to judge how the ploughing has been done by walking across the field . . . 25 Points
 2. **Preparation.**—Preparation of the seed bed before sowing the crop . . . 15 points
 3. **Sowing of the Crop.**—If sown in rows it must be across the slope, or on the contour. When sowing on the contour every third furrow must be sown behind the plough when ploughing. Good sound seed must be used; this can always be seen by the even germination obtained . . . 25 points
 4. **After Cultivation.**—Whether seed is sown in rows or broadcasted; harrowing to kill young weeds and to conserve moisture; thinning out crop to proper distances apart; cultivation of land and freedom from weeds . . . 20 points
 5. **General Appearance.**—The whole crop must have a healthy, well grown appearance. The outsides of the field must have been neatly finished off, planted and kept clean . . . 25 points
-
- TOTAL 100 points
-

When judging Class "C" the same conditions must be observed as for Class "B," but the following points must also be taken into consideration:—

1. The crop must be uniform and true to type. In the case of wheat, all rye and wild oats must be rogued. In sorghum, wheat and peas, all plants not true to type must be eradicated, or, as in the case of sorghum, harvested first.

2. These fields should be inspected two or three times during their growth; the final inspection taking place during the harvest, when the heads of sorghum, mealie cobs and bundles of wheat for seed may be finally inspected.

Great keenness was shown by Natives who entered their fields for the competition under Class "B." Many of the lands shown had been managed in an excellent manner and did great credit to their owners. Some of the winning lands had been manured with superphosphate and the maize plants dressed with Derrisol to kill the mealie stalk borer; both operations were carried out at the owners' expense.

There was only one entry in Class "C" which was not of a very high standard, but no doubt now that it is understood what is required, improvement will be rapid.

Class "B" was divided into sub-class I for under 15 entries per demonstration district, and into sub-class II for over 15 entries. 242 fields were entered for the competition; these consisted of 15 entries in sub-class I, and 227 in sub-class II.

Considering the adverse conditions, the number of entries may be taken as very satisfactory.

VEGETABLE GARDENING AND FRUIT CULTURE.

The Administration continues to encourage the Basuto in every possible way to lay out terraced vegetable gardens in their villages, together with water conservation schemes and compost pits. The gardens are often made on ground which was considered useless because of erosion. Much of the Agricultural Demonstrators' time is now taken up with this form of Agriculture, as the Natives, especially the women, are fully realising the benefits to be derived from vegetable gardening, both as the best means of producing more food from a small area and as a change of diet, which is so necessary for the good health of the nation.

Splendid terraced gardens have been made in what were thought to be impossible sites and it is certain that the lessons learned regarding the use of manure and water in the gardens will be carried into practice in the agricultural lands.

Besides the assistance rendered by Agricultural Officers and Demonstrators in the laying out and management of vegetable gardens, the Administration is encouraging the production of vegetables and fruit in the following ways:—

(a) Practical gardening classes are held for teachers and students at the principal Mission Schools. Many school gardens have been started all over the territory and the work is being supervised by the local Demonstrators. From these gardens young people obtain vegetable plants with which to start small gardens at their own homes, thereby cultivating a liking for vegetables.

(b) Fenced garden plots have been established on the Government reserves for Native Police and Civil Servants. The help of the local Demonstrator is always at their service.

(c) The formation of Native Women's Agricultural Associations in the villages. This continues to be one of the best methods of rousing interest in vegetable growing.

(d) The free issue of vegetable seed to Native gardeners, especially to those who have recently laid out gardens. This scheme is much appreciated by the Natives, and undoubtedly is a great help in advancing the project of vegetable growing. The following is a list of the total amount of vegetable seed issued under this scheme through 26 Agricultural Demonstrators:

156 lbs. Lucerne; 78 lbs. Carrot; 52 lbs. Swiss Chard; 52 lbs. Cabbage; 26 lbs. Onion; 78 lbs. Swede Turnip; 52 lbs. Cauliflower; 52 lbs. Tomato; 26 lbs. Hubbard Squash.

Further issues of seed totalling 7½ lbs. Cabbage, 2 lbs. Cauliflower, 5 lbs. Onion, 10 lbs. Swiss Chard, 6 lbs. Swede, 100 lbs. Lucerne, 1½ lbs. Pumpkin and 1 lb. Hubbard Squash were made through various Agricultural Officers where gardens were

damaged by hail and where the number of gardens were increasing so rapidly that the first issue of vegetable seed was not sufficient.

The lucerne is for planting on the banks of the terraces in the gardens to prevent washing; it also forms an excellent spinach.

(e) Competitions for the best vegetable gardens. A sum of money is provided annually on the estimates for prizes, and the competition among the owners of gardens is very keen. Great enthusiasm is shown. It is impossible to name for special praise, the gardens of any one district, but there are now hundreds of gardens all over the territory which are an absolute credit to their owners.

(f) The provision of markets where surplus vegetables can be sold. This undoubtedly is a great incentive to many people to construct gardens and grow vegetables. The Natives are, however, being constantly advised to grow vegetables chiefly for their own consumption. They are informed, through lectures, how the different vegetables should be cooked, and a taste for this kind of food is becoming far more pronounced: for example, when gardens were started a few years ago, perpetual spinach and swede turnips were seldom eaten, now they are much relished.

(g) The appointment of an Agricultural Demonstrator to certain districts, who can devote the whole of his time to the laying out and to the supervision of vegetable and fruit gardens and the formation of Gardening Associations. This idea has been carried out in the Maseru district with great success.

(h) Fruit trees, chiefly peaches and apricots, raised in the various Government Nurseries are distributed in the late winter as small rewards to those who have carried out the Department's advice with reference to the winter cultivation of their gardens. 1,890 peach and apricot trees were distributed. 5,316 peach trees were planted on the contour terraces. The Vegetable Garden Competition of 1938 was a great success. Particulars of the competition and of the scale of points used when judging were all detailed in the Department's Annual Report of 1937. An amount of £57 10s. 0d. was paid out in prize money. There were 598 gardens shown in Class I and 1,027 in Class II, making a total of 1,625 shown out of a then known total of 1,774.

List of Vegetable and Fruit Gardens in the Territory up to 30th September, 1938, and in previous years.

District	No. of gardens worked in 1936/37	No. of gardens worked in 1937/38	No. of gardens worked in 1938/39	Increase in 1938/39
Maseru	177	456	795	339
Mafeteng	192	317	523	206
Mohale's Hoek	114	186	199	13
Quthing	33	90	237	147
Teyateyaneng	50	57	83	26
Leribe, Peka and Butha Buthe	131	279	555	276
Qacha's Nek	125	339	485	146
Mokhotlong	15	50	50	No increase
TOTALS	837	1,774	2,927	1,153

As will be seen from the above tabulated list, there were, on the 1st October, 1937, 1,774 properly laid out vegetable gardens which had been established under the advice and assistance of the Agricultural Department. At the end of September, 1938, there were 2,927, an increase of 1,153, which is highly satisfactory. The Agricultural Officers report that many Natives are following the example set by others, and there are a large number of vegetable gardens all over the territory which have been laid out without the help of the department. It is estimated that there are far more than 1,000 of these gardens. In the light of these figures the Government's hope of having 20,000 gardens at the end of a further three of four years is now a possibility. The trading community in certain parts of the country state that the sale of vegetable seed is increasing by leaps and bounds.

PROTECTION OF THE FLORA AND FAUNA OF BASUTOLAND.

The interest shown in this matter by the Administration and the Paramount Chief is apparent. The Paramount Chief issued orders to the Chiefs that he held them responsible for the care of the wooded valleys in their districts; these orders have had good effect.

Certain plants, such as the Aloe polyphylla and different varieties of the Gladiola, were being removed in a wholesale manner from the territory. These plants have now been protected by the Resident Commissioner's Notice of the 20th September, 1938, which appears in the Official Gazette No. 1,958, dated 30th September, 1938. If considered necessary at any time, further plants will be added to this list.

PUBLICATIONS:

(1) Winter Cereals Interim Report	By Mr. H. C. Mundell, Agricultural and Livestock Officer.
(2) Summer Cereals, Grasses, Trees Interim Report	
Production of Strong Wheat in Basutoland	By Mr. R. W. Thornton, C.B.E. and Mr. L. F. Wachter, M.B.E.
Some Notes on the "Indore" Method of making Humus from Mixed Plant Residues	By Mr. L. F. Wachter, M.B.E., written for publication in the Native Newspapers and for the general use of the Agricultural Officers and Agricultural Demonstrators.

PART III.

FINANCIAL STATEMENT.

REVENUE:

Nil.

EXPENDITURE:

£9,387 12s. 10d.

The period covered by this report is from the 1st October, 1937, to the 30th September, 1938, while the Financial Year is from the 1st April, 1938, to the 31st March, 1939.

PART IV.**LEGISLATION.****Protection of Flora and Fauna.**

Resident Commissioner's Notice dated 20th September, 1938, in the Official Gazette No. 1,958 of 30th September, 1938.

CONCLUSION.

I wish to tender my sincere thanks to my staff and colleagues for their assistance and loyal co-operation throughout the year, when, owing to my absence on overseas leave, the duties devolving on them were of a heavier nature than usual.

(Sgd.) L. F. WACHER,
Agricultural Officer

IMPORTED MANITOBA WHEAT ISSUES AND RETURNS, ETC.

(ANNEXURE A.)

1937-1938.

District.	Amount on hand 1937 (in bags of 200 lbs.).	Amount issued 1937-38 (in bags of 200 lbs.).	Amount which should have been returned 1938 (in bags of 200 lbs.).	Amount actually returned 1938 (in bags of 200 lbs.).	Total crop reaped from issue 1938 (in bags of 200 lbs.).	No. of bags which should be returned from 1938-39 harvest, owing to partial failure of 1937-38 crop	Total amount of seed for re-issue in 1938-39 (in bags of 200 lbs.).	Remarks.
Maseru	37	37	37	37	258	—	37	The Manitoba wheat crops were an entire failure in the lowland districts: no issues were recovered. The crop in the mountain districts was fair. Natives in these districts were allowed to return 1 bag for 1 issue.
Mafeteng	78½	29½	59	22	46½	—	71	The wheat crop in this district was practically a failure; only 8 bags were grown in the Mafeteng District and were re-issued to the growers. No issues were made owing to the drought in the Thabaneng area.
Mohale's Hoek	47	16	32	2	10½	—	23	The wheat crop was almost an entire failure in this district.
Quthing	21½	4½	9	8	28	—	13	A fair wheat crop was grown in the Mphaki area. Owing to drought the 12 bags of seed in hand were not issued in the Quthing District.
Carried Forward	184	87	137	69	343	—	144	

(Continued Next Page.)

(Continued from Previous Page.)

IMPORTED MANITOBA WHEAT ISSUES AND RETURNS, ETC. (ANNEXURE A Contd.)

District.	Amount on hand 1937 (in bags of 200 lbs.).	Amount issued 1937-38 (in bags of 200 lbs.).	Amount which should have been returned 1938 (in bags of 200 lbs.).	Amount actually returned 1938 (in bags of 200 lbs.).	Total crop reaped from issue 1938 (in bags of 200 lbs.).	No. of bags which should be returned from 1938 '39 harvest, owing to partial failure of 1937-38 crop	Total amount of seed for re-issue in 1938-39 (in bags of 200 lbs.).	Remarks.
Brought Forward	184	87	137	69	343	—	144	
Teyateyaneng	3	3	6	3	7½	—	3	The wheat crop was almost an entire failure in this district.
Leribe (including sub-districts of Peka and Butha Buthe)	12	7	14	3½	8½	—	8½	The wheat crop was almost an entire failure in this district.
Qacha's Nek (including the sub-district of Mokhotlong)	143	79¼	150½	61	169	—	125¾	The wheat crops suffered severely from drought in this district, with the exception of the Mokhotlong and Thaba Tseka areas, where the climatic conditions were slightly more favourable.
TOTALS	342	176¼	307½	136½	528	—	281¼	

A total of 528 bags was harvested from 176¼ bags sown, and 281¼ bags were returned to the Government for re-issue. This poor return of 2.95 bags from one bag sown, is accounted for by the reasons given in the remarks column.

The unit of measure for wheat is 1 bag = 200 lbs. The majority of the bags harvested were what are known as "machine filled" bags, which, in the case of Manitoba wheat, average 250 lbs. per bag.

ANNEXURE B.

THE 1937-38 ISSUE OF MANITOBA WHEAT RETURNED TO
THE GOVERNMENT BY PRODUCERS IN 1938.

District.	Amount returned from the 1937-38 issue, plus seed on hand from previous season.	Total.	Remarks.
Maseru	Bags. 37	Bags. 37	Re - issued in the Demonstration areas where produced.
Mafeteng	71	71	Ditto.
Mohale's Hoek	23	23	Ditto.
Quthing	13	13	Ditto.
Teyateyaneng	3	3	Ditto.
Leribe (including the sub- districts of Peka and Butha Buthe)	8½	8½	Ditto.
Qacha's Nek (including the sub- district of Mokhotlong)	125¾	125¾	Ditto.

WHEAT DEMONSTRATION PLOTS, SEASON 1937-38. (Results given in Machine Filled Bags of 250 lbs.)
ANNEXURE C.

District.	Demonstration Plots.			Native worked or Check Plots		Remarks.
	Variety	No. of Plots	Yield per acre in bags	Acreage	Yield in bags	
Maseru	Chiefly Mani- toba, Union 52 and 27, and Basuto mixed wheat.	43	144.25	13	33.5	The wheat crop in the lowlands was almost a failure. The result in bags per acre, .73, includes lowland and mountain crop averages, while the yield of 2 bags per acre Check Plots only includes those taken in the mountain districts. The lowland check plots were all failures.
Mafeteng	Ditto.	—	—	—	—	The wheat crop was a complete failure in the lowland area of this district. No results were received from Semonkong, where the wheat crop was good, owing to the Demonstrator being dismissed.
Mohale's Hoek	Ditto.	4	9	3	12	10 Check Plots all turned out complete failures.

WHEAT DEMONSTRATION PLOTS, SEASON 1937-38. (Results given in Machine Filled Bags of 250 lbs.)
ANNEXURE C (Contd.)

District.	Demonstration Plots.			Native worked or Check Plots			Remarks.
	Variety	No. of Plots	Acreage per acre in bags	Yield per acre in bags	No. of Plots	Acreage per acre in bags	
Quthing	Ditto.	13	21.25	1.33	13	20	.39 No wheat was planted in two demonstration areas in the Quthing district.
Qacha's Nek (including Mokhotlong sub-district)	and Basuto mixed wheat.	12	16.5	3.27	11	23	2.4 A fair crop of wheat grown in this district.
Tevateyaneng							Crop was a complete failure in this district.
Leribe (including sub-districts of Peka and Butha Buthe)	Chiefly Mantitoba, Union 52, 27	3	11	.32	No Check Plots available.		The wheat crop was a complete failure in the Peka and Leribe districts; a very light crop was reaped in the Butha Buthe district.

There were 72 plots which were complete failures in the wheat demonstration work comprising an area of 164 acres. The cause of such a large number of failures was due to the unusually dry weather conditions in the lowland districts of Basutoland during the winter and spring.

WHEAT DEMONSTRATION PLOTS AT MISSIONS.

Results given in bags of 200 lbs.

No. of Plots	Variety	Total Acreage	Yield per acre	Remarks.
1	Red Egyptian and Manitoba.	3.5	2.75	Grown on well-cultivated land at Leloaleng. Birds severely damaged this crop.
1		8	.6	Grown at Roma. Land twice ploughed and manured with 200 lbs. superphosphate per acre. This plot, which was so well cultivated and manured, showed how poor the general wheat crop was in this district, as this plot produced the out-standing crop.

All wheat sown in demonstration plots is first treated (before being sown) with Copper Carbonate as a preventative against smut. Excellent results have always been obtained from this treatment. The Native growers have profited by the demonstrations, and many more than heretofore now treat their seed wheat before sowing. The refusal of many traders to buy smutty wheat has also had a most beneficial effect.

MAIZE DEMONSTRATION PLOTS, SEASON 1937-1938.

ANNEXURE D.

Results given in bags of 200 lbs.

District.	Demonstration Plots.			Native worked or check plots.			Remarks.
	No. of Plots	Acreage	Yield per acre in bags	No. of Plots	Acreage	Yield per acre in bags	
Maseru	45	142	5.7	50	131.75	3.3	The maize crop was, in general, much below that of the last seasons, due, in many instances, to late planting.
Mafeteng	10	45.75	2.14	8	39	1.61	
Mohale's Hoek	33	68	2.7	28	79	.5	
Quthing	22	49.75	4.4	20	45	1.9	
Teyateyaneng	6	35.5	8.8	6	25	5.5	
Qacha's Nek (including sub-district of Mokhotlong)	32	80	3.7	28	62.25	1.6	
Leribe (including sub-districts of of Peka and Buttha Buthe)	58	186.5	4.2	35	112.5	3.4	

MAIZE DEMONSTRATION PLOTS AT MISSIONS.

Maseru	Roma	5	37.75	10.2	—	—	—	Some remarkable plots all fertilized at 200 lbs. superphosphate. Unfertilized.
	(Moriija)	2	4	4	—	—	—	
Quthing (Lelotaleng)		7	17.75	7.8	—	—	—	The maize crop was good, the land was well cultivated and kraal manured every third year in rotation for beans.

There were 32 plots comprising an area of 77.25 acres, which were complete failures in the maize demonstration work. These failures were due to a very dry planting season and to attacks of the mealie stalk borer and cutworm.

SORGHUM DEMONSTRATION PLOTS, SEASON 1937-1938.

ANNEXURE E.

Results given in bags of 200 lbs.

District.	Demonstration Plots.			Native worked or check plots.			Remarks.
	No. of Plots	Acreage	Yield per acre in bags	No. of Plots	Acreage	Yield per acre in bags	
Maseru	4	9	5.72	3	11	4.31	No sorghum plots were planted in this area.
Teyateyaneng	—	—	—	—	—	—	
Leribe (including sub-districts of Peka and Buthe)	6	21	3.51	5	17.5	1.58	No sorghum plots in this area.
Mafeteng	—	—	—	—	—	—	
Mohale's Hoek	—	—	—	—	—	—	Only one plot planted which failed to germinate.
Quthing	2	5.5	4.4	2	5.75	1.8	No check plots taken. Very little sorghum grown in this district except in the Orange River Valley.
Qacha's Nek	4	9.5	3.22	5	9	.66	
Mokhotlong	1	1.5	2	—	—	—	

Fewer sorghum plots than usual were worked by the Agricultural Demonstrators, owing to the planting being delayed until it was too late to sow. This was due to the late advent of the spring rains.

Dusting the seed with Copper Carbonate powder before planting, as a preventative against smut, continues to give good results.

An outstanding crop of sorghum (Roma White) was again grown by the Marist Brothers at Roma. 1.5 acres yielded 13.3 bags to the acre. This land was well cultivated and received 200 lbs. of superphosphate to the acre. The land on which this crop was grown is not of the best and therefore demonstrates what can be produced by proper management.

POTATO, PEA, RYE, AND BEAN DEMONSTRATION PLOTS, SEASON 1937-1938.

ANNEXURE F.

Crop.	Variety.	No. of Plots	Acreage	Yield per acre in bags	Remarks.
Potatoes	Lord Roberts	4	5.75	67.12	Of the 4 plots 3 gave indifferent yields, one plot was outstanding.
Peas	Basuto Field Pea.	4	5	3.6	A fair crop only was obtained from the 4 successful mountain district pea plots.
Rye	Rye	—	—	—	Rye was sown for winter grazing of stock at all the missions where demonstrators are stationed. No crop was afterwards reaped owing to the dry spring.
Beans	7-year Beans and Whippoorwill Cow Peas.	12	25	2.08	The crop was greatly reduced owing to the bloom being badly eaten by the C.M.R. Beetle.

Beans and Peas Unit of Measure: A bag of beans = 200 lbs.

Potatoes Unit of Measure: A bag of potatoes = 150 lbs.

Rye Unit of Measure: A bag of rye = 200 lbs.

The pea crop was practically an entire failure in the lowlands, due to spring drought. The six bags of seed issued last year for demonstration purposes, unfortunately did not produce any crop.

Many small issues of Seven Year Beans and Peas were made to Natives owning gardens, and excellent crops were obtained. There was no outstanding field crop of Seven Year Beans reaped this season, due to drought experienced at planting time, and to severe damage to the bloom at flowering time by beetles.

A larger acreage of peas was planted in the mountain districts than last year; excellent crops were secured.

Potatoes continue to be grown on a much more extensive scale than in the past. The Mission Stations are still the chief source of the supply of seed. The Marist Brothers, on their demonstration plot at Roma, produced a record crop of potatoes — 140 bags to the acre. The field was excellently cultivated and received a heavy dressing of kraal manure plus 200 lbs. of Superphosphate to the acre.

ANNEXURE G.

COMPARATIVE MANURIAL TRIALS, 1937/38.

(Results given in bags of 200 lbs.)

MAIZE.

Superphosphate.

11 Acre plots of maize, laid down on all types of ground throughout the territory, were manured at the rate of 200 lbs. of superphosphate per acre and averaged 3.97 bags per acre. 2 acre plots of maize at Peka, on vleis ground, were manured at the rate of 150 lbs. of superphosphate and averaged 6 bags per acre. Two check plots on the same ground which received no manure, yielded 3.66 bags per acre.

Nine plots of 45.75 acres, at the various Missions, were manured at the rate of 200 lbs. of superphosphate, and averaged 9.24 bags per acre. This high average crop is accounted for by an outstanding crop of maize at Roma, viz., 37.75 acres averaging 10.2 bags per acre.

Kraal Manure.

7 Acre plots, manured at the rate of 19,700 lbs. of kraal manure per acre, averaged 5.11 bags per acre.

Kraal Ash.

3 Acre plots, manured at the rate of 6,000 lbs. Kraal Ash per acre, averaged 2.83 bags per acre.

No Manure.

10 Check plots receiving no manure averaged 1.01 bags per acre.

An interesting manurial experiment was carried out at Leribe on poor soil, the demonstrator making compost by littering his cattle kraal with old wheat straw. 50 Scotch cart loads were applied to one acre of maize, and 6.7 bags were harvested. Unfortunately there was no Check Plot, but the yield of the surrounding fields was very poor.

ENGINEERING SECTION.

Anti-Soil Erosion and Irrigation Work.

PART I.

STAFF AND ORGANIZATION.

(1) STAFF.

E. R. Roberts, B.Sc., Civil Engineer, appointed 6/1/37.

W. K. Hudson, Surveyor, seconded from the Public Works Department, 8/7/37.

The eight Agricultural and Livestock Officers, who are in charge of all anti-soil erosion operations in the field, are recorded in the Agricultural Officer's report.

With the exception of the transfer from the Veterinary to the Agricultural Division of Mr. B. P. Harding, there have been no staff changes during the year.

Mr. L. H. Collett, who received a Carnegie Visitors' grant to study soil conservation work in the United States of America, returned to the territory for duty in December. Mr. Collett's report on his tour covers nearly all aspects of soil conservation, and great benefit to the work in Basutoland and elsewhere is to be expected as a result of this report.

Mr. Harding proceeded to Quthing on Mr. Collett's return, and anti-erosion work was started in this district in February.

(2) ORGANIZATION.

The organization with respect to allocation and supervision of work, described in the previous report, has been retained.

The number of Native labourers under each European foreman, however, has been reduced to fifty, for it was found that large labour gangs were not efficient, due to the impossibility of giving sufficiently detailed supervision.

During the year, all European foremen have been carefully trained in the practical side of soil conservation work. The training covers the layout and construction of terrace systems, the construction of dams, inlets, etc., grass and tree planting, fencing, the management of plant and the use of the Dumpy level. Foremen are also expected to keep time books showing the allocation of expenditure on the different items of the work, and to make out the pay-sheets accurately. Seven of the fourteen foremen employed by the Agricultural Department on anti-erosion work, were tested during the year and found competent in the use of the level and in the various other phases of the work, and were accordingly promoted to a higher wage. The fact that these foremen are capable of taking charge of the work, enables the Agricultural Officers to devote more time to their numerous other duties.

(3) NEW GANGS.

Four new gangs were started during the year. With the exception of the Maseru district, where the original three gangs

have been retained, and of Quthing, where there is a shortage of labour, all Lowland districts now have two gangs employed on anti-soil erosion work.

PART II.

ANTI-EROSION WORK, PLANT AND GENERAL.

WORK DONE.

(1) Area Terraced and Terrace Bank Constructed.

The following table gives the area reclaimed by terracing and the length of terrace bank completed in each district during the year.

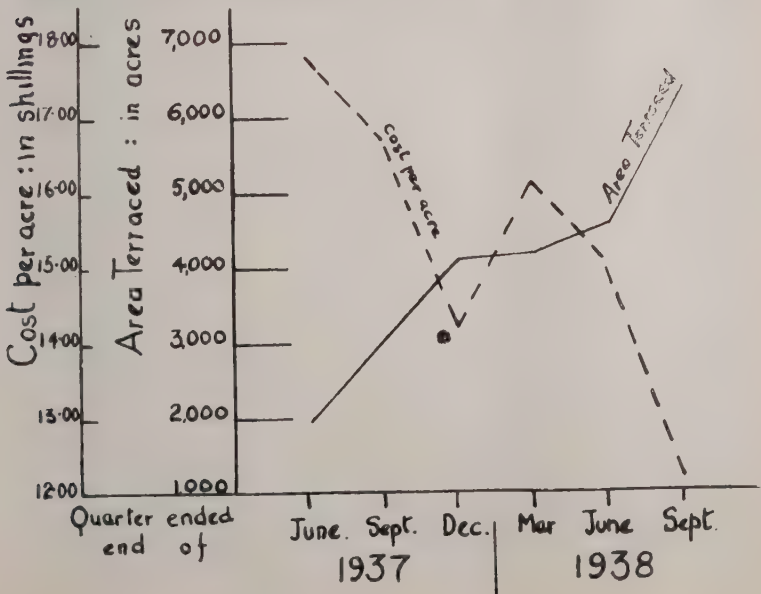
District.	Area Terraced; in acres.	Length of Terrace completed; in yards.
Butha Buthe	2,387	286,948
Leribe	1,537	216,795
Teyateyaneng	4,639	455,738
Maseru (Reserve)	362	48,954
Maseru (Pack Saddle)	1,303	116,473
Maseru (Matsieng)	2,410	298,741
Mafeteng	3,675	357,334
Mohale's Hoek	2,596	262,315
Quthing	331	35,448
TOTAL	19,240	2,078,746

The amount of work completed in each district during the year was resultant on the period and conditions of working, date of acquisition of power plant, supply of labour, etc.

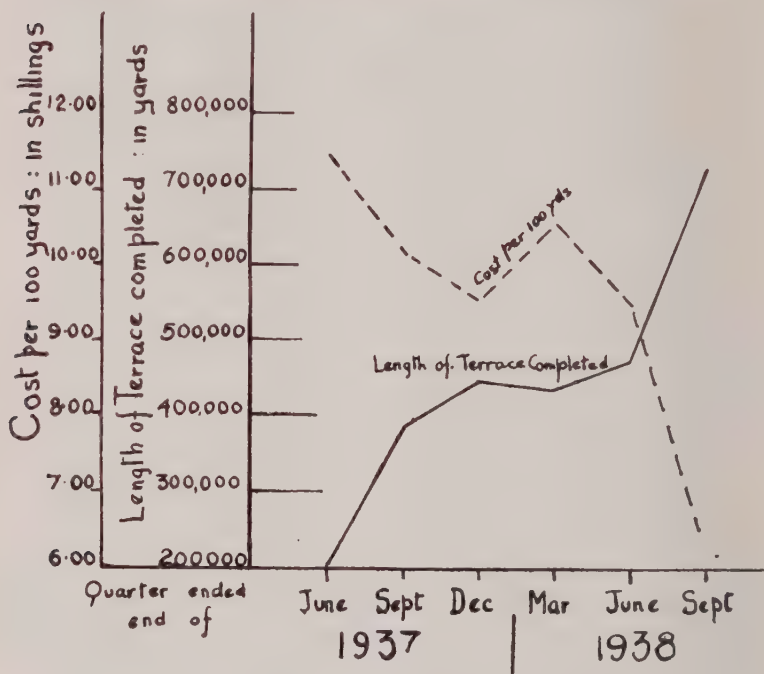
GRAPHICAL REPRESENTATION

of

(A) The area reclaimed by terracing during each quarter since the 1st April, 1937, and the cost per acre reclaimed.



(B) The length of terrace completed during each quarter since the 1st April, 1937, and the cost per 100 yards of terrace constructed.



These graphs show:—

(i) that the area terraced and length of terraces completed each quarter have increased very considerably during the period considered;

(ii) that unit costs of work have been very greatly reduced;

(iii) that except in the case of the quarter ended 31st March, 1938, the increase in work and reduction in unit costs each quarter have been fairly consistent;

(The amount of work completed in the quarter ending 31st March, was practically the same as that for the preceding quarter, and unit costs were higher. This was due to the fact that cultivated lands were under crops during this period, and all terrace construction was, of necessity, almost solely confined to heavy training bank construction in pastureland, a great proportion of which was steep, stony and extremely difficult to work.)

(iv) that the use of power plant greatly increases the amount of work done and reduces unit costs very considerably. This is shown on the graphs by the increased steepness of the curves after the dates of acquiring new power plant in June, 1937, and again in June, 1938.

The graphs reflect a very satisfactory state of affairs, which has resulted from the untiring determination of all officers concerned to improve construction, increase the amount of work done each quarter and reduce costs of working.

(a) **Area terraced.**

Area terraced during the year .. 19,240 acres.

Area previously terraced 8,316 acres.

Total area terraced 27,556 acres.

The figures given represent the actual area reclaimed by terracing, and do not include the very considerable areas below the works, which are safeguarded from erosion in the future as a consequence of the terrace systems constructed above.

The area terraced during the year must be considered highly satisfactory, in view of the fact that many of the areas reclaimed were excessively eroded, and terrace construction in these areas was comparatively slow.

The degree of erosion of the different areas worked varied greatly, but sheet erosion and incipient gully erosion were common to all.

(b) **Length of terrace bank constructed.**

Length of terrace bank constructed during
the year 2,078,746 yards

Length of terrace bank previously constructed 858,831 yards

Total length of bank constructed 2,937,577 yards

The length of terrace bank given does not include partially completed work, cut by plant, but necessitating the raising of the bank in hollows or at gully crossings by scrapers or by handwork.

The figure of 2,078,746 yards, or approximately 1,181 miles of terrace constructed during the year, represents a total of approximately 2,100,000 cubic yards of earth moved.

The standard of terrace construction during the year has been good, and well proportioned terraces with wide clean furrows have been obtained.

(c) **Unit costs.**

Area. The mean unit cost per acre of all anti-erosion work completed in the territory during the year was 14.58 shillings.

This figure includes supervision and transport expenditure, tractor costs, wages, etc., incurred for all the various works, such as terracing, treeplanting, dam and weir construction, etc., but excludes overhead clerical expenses and depreciation on plant, equipment, etc.

The mean cost per acre for the year, is 2.40 shillings less than that for the period considered in the previous annual report. This reduction in cost is especially satisfactory, in view of the fact that a great amount of work has been done during the year in all phases of the project, notably in treeplanting and dam construction, entailing considerable expenditure with resultant raising of unit area costs.

Terrace bank.

The mean unit costs for the total length of bank completed during the year were:—

8.94 shillings per 100 yards of completed bank.

0.89 shillings per 10 cubic yards of earth shifted.

These costs include cost of labour, total running expenses of plant, cost of feed for oxen, etc., but exclude cost of supervision by Officers, transport expenses and general overhead expenses.

The mean cost per 100 yards of terrace for the year is 1.66 shillings less than that for the period considered in the previous report, and the mean unit cost of earth moved has been reduced in the same proportion.

The reduction in costs is due to the increased efficiency in handling plant and in the avoidance of unnecessary hand labour.

(2) Weirs.

Number of weirs constructed during the year: 4.

The weirs constructed were all of stone but varied in design. The water diverted by the weirs is disposed of by spreading it over pasture, which is thus benefited.

The initial cost of weirs is high, and usually considerable maintenance is necessary. It has been decided, therefore, to construct weirs in future only when no practical alternative exists.

(3) Grass Inlets and Meadow Strips.

Number of grass inlets constructed during the year: 29.

As predicted in last year's Annual Report, a considerable number of grass inlets have been constructed during the year for the disposal of excess water from terrace systems.

The inlets are constructed saucer-shaped and are usually solid sodded with a strong growing grass. For preference, the vegetative cover is composed of long foliage grasses which are flattened out by the force of the water, thus providing a smooth, erosion resistant surface over which the excess water is disposed.

The grade that is given to grass inlets depends on numerous factors, such as the type of soil, quantity of water to be handled, etc. Grades between 1 in 8 and 1 in 3, are common; a grade of as much as 1 in 1 has been given in certain instances.

It is as yet too early to determine the ultimate success of grass inlets, but from the manner in which the inlets, already constructed, disposed of excess run-off from the heavy storms during the year without damage, there is every indication that these inlets will prove successful.

Pastureland which is not likely to be ploughed, owing to stone outcrops or waterlogging, is being utilised to an increasing degree, for the disposal of excess waters from terrace systems. Unfortunately, strips of pastureland of the required size and conformity, are extremely rare in Basutoland.

(4) Dams Constructed.

Dam construction has been intensified during the year owing to the importance of dams in soil conservation work, not only

for the slowing up and retention of surface run-off, but also for the purpose of reducing trampling of pasture, by providing numerous convenient watering places for stock.

(a) **Number constructed.**

Number of dams constructed during the year ..	20
Number of dams previously constructed	29
Total number of dams constructed	49

In addition to the twenty major dams constructed during the year, only one of which has a full supply capacity of less than 200,000 gallons, a considerable number of small dams, formed by water being retained behind gully crossings, have been constructed in all districts.

Further, in the Matsieng area, Maseru district, a long, low cut-off bank was constructed across the lower end of a large natural vlei, in order to divert the flood water from the head of a donga which was eating back and would eventually have drained this valuable vlei. The water level in the vlei was raised 2½ ft. by the cut-off bank, and the capacity of the vlei thus increased by approximately 34 million gallons.

(b) **Principal dams.**

A large dam, with full supply capacity of 13 million gallons, was constructed in the Maseru Reserve to irrigate the additional multiplication plots recently established.

A dam of 2 million gallons capacity, also for the irrigation of multiplication plots, was built in the Mohale's Hoek district.

In the Mafeteng district a large stock dam, storing almost 5 million gallons, was constructed.

The big dam constructed during the year, in the Maseru Pack Saddle area, has a capacity of over 11 million gallons. This dam is of special interest, as it finishes off the whole of the terrace system of the main Pack Saddle Valley. It is so situated in the main drainage line, that all excess water from the extensive system of terraces and small dams in the valley, has to pass eventually into this main dam, where a very large percentage of the excess water is stored. Any overflow from the dam is returned to the main drainage line, over a grass spillway terminating in a grass inlet.

(c) **Total capacity.**

The total amount of water impounded at full supply level, by the twenty major dams constructed this year, is 36½ million gallons.

(d) **Unit costs.**

The unit costs of construction varied considerably. The following are the mean unit costs:—

Cost per 1,000 gallons of water impounded ..	0.60 shillings.
Cost per 10 cubic yards of embankment .. .	5.13 shillings.

The costs include cost of labour and supervision, tractor expenses, cost of feed for oxen, etc., but exclude overhead expenses, depreciation of plant, implements, etc.

The lowness of the unit costs is due principally to the use of power traction in the construction of the embankments.

(5) Multiplication Plots.

The plots previously established in each district for the multiplication of trees and grasses for anti-erosion work, have proved invaluable.

Further investigation work on numerous varieties of grasses has been carried out at the Maseru experimental plots during the year.

Grasses.

Of all the numerous grasses tried, *Kikuyu* and *Cynodon dactylon* have most nearly met the requirements that for soil conservation work, a grass be perennial, drought and frost resistant, and of rapid spreading growth, besides being palatable to stock. Unfortunately, these two grasses cannot be established from seed, and the cost of planting banks to grass is comparatively great. Also, *Cynodon dactylon* might prove undesirable if planted on terrace banks in cultivated lands.

Setaria phacelata is the most promising of the new varieties introduced. It is easily established from seed and its growth is rapid and exceptionally strong, yet it can safely be used in cultivated lands. A large quantity of seed is being purchased to enable extensive field trials to be carried out.

The establishment of thatching grass, (*Hyparrhenia*) from seed, on banks in cultivated lands is being tried. It is hoped that these field trials will prove successful, for if thatching grass become quickly and permanently established, it will not only afford the necessary dense vegetative cover but will also be of great value to the Native for roofing purposes. Thatching grass is at present being planted on an extensive scale on terrace banks, in order to prove or disprove its suitability under varying field conditions.

Trees.

Robinia pseudo-acacia, and the local poplar have proved the most suitable trees for soil conservation work yet tried.

Gleditsia triacanthos is at present under trial and appears promising. Great numbers of these are now being raised.

Many other forest trees which coppice or sucker readily and extensively are being tested, such as Chinese, Siberian and English Elms and several varieties of poplar other than the local *Populus canescens*, var. *rossii*, etc., etc.

Peach trees have been raised on an extensive scale in all multiplication plots and a considerable number were planted out on terrace banks during the year.

(6) Planting and Sowing of Banks.

Work in the planting and sowing of terrace banks has been intensified during the year, in an attempt to establish a permanent vegetative cover on all banks constructed, in order that these may be safeguarded against the scouring action of rain and surface waters and damage by stock.

Investigations are being carried out in several areas to determine the effectiveness of grass buffer strips as erosion checks. Numerous varieties of grasses are being tried under different conditions. In one particular trial the grass is being planted on low, narrow-base banks of level grade, which have been constructed to assist in the establishment of the grass.

Pasture areas.

In pasture areas, hardy perennial grasses, which are palatable to stock, are planted.

(i) Approximately 190,000 yards of terrace bank was planted to the local Couch grass (*Cynodon dactylon*) and openings in this length of bank were sodded.

(ii) Several thousand yards of bank was planted to Kikuyu which, in general, has become well established. Kikuyu appears especially useful in the protection of dam embankments, for it usually grows very strongly in these situations, and provides a deep, closely matted vegetative cover which, on the upstream slope of the embankment, is effective in breaking the wave action of the water in the dam; thus, dam embankments and numerous gully crossings were sodded to Kikuyu during the year, instead of being pitched with stone.

(iii) Over 21,000 yards of terrace bank was planted to young aloes during the year. Aloes are planted only when readily available in the vicinity of the area terraced.

Cultivated Areas.

Grasses which are difficult to eradicate are not planted in cultivated lands.

(i) As recorded in the previous report, the sowing of lucerne on terrace banks in cultivated areas is under trial.

Over 626,000 yards of terrace bank, representing an area of approximately 500 acres, was sown to lucerne during the year.

Results have varied greatly, but in general, where weather conditions were favourable and temporary protection against grazing and trampling by stock was afforded, the lucerne has become thoroughly established. Numerous very fine stands of lucerne planted last year, are to be seen in the various terraced areas.

(ii) Approximately 60,000 yards of terrace bank was planted to thatching grass during the year. The grass was obtained in the vicinity of the areas worked.

It is as yet too early to determine the ultimate success of planting thatching grass on terrace banks, but as this grass is indigenous, there is every hope that it will prove successful.

(7) Tree Planting.

Number of trees planted during the year 128,662

Number of trees previously planted 43,296

Total number of trees planted 171,958

The number of trees planted in the territory during the year was made up as follows:—

Robinia pseudo-acacia	..	..	..	..	52,073
Gleditsia Triacanthos	..	..	..	..	580
Native poplar	..	..	..	..	50,905
Pines	..	..	..	..	10,699
Gums	..	..	..	..	1,983
Willows	..	..	..	..	1,897
Deodars	..	..	..	..	2,227
Cypress	..	..	..	..	4,803
Oaks	..	..	..	..	472
Peach	..	..	..	..	1,628
Various (privet, hawthorne, etc.)	..	..	..	..	1,395

As is seen from the above figures, the planting of trees in fenced areas and in gullies was intensified during the year. The benefits derived from tree-planting done in previous years have already become apparent, and are being more fully realised by the Chiefs, several of whom have actually applied for fenced plantations to be established in their areas.

(a) Plantations.

The trees in the plantations previously established, have grown remarkably well, and numerous indigenous grasses, which have become self-established, now cover the area between the trees. It is difficult to believe that many of these areas were once severely gullied and completely denuded.

Pines, gums, deodars, cypress, oaks, and various other trees and shrubs, were planted in the fenced areas previously established, and in numerous new enclosures. Robinias and the Native poplar are planted, interspersed among the other trees. The trees planted during the year appear well established; late planting of Robinias was especially successful.

(b) Planting of Gullies.

Gullies in the areas worked have been planted to trees, principally to the Native poplar, which is readily procurable in nearly all areas.

Willows have also been utilised for the reclamation of gullies; they are planted where moist soil conditions prevail.

At the present time no protection is afforded to trees planted in gullies, and an appreciable amount of damage was done during the year by Natives and stock uprooting the newly-planted trees.

(c) Planting of Terraces.

Most of the 1,628 peach trees utilised in connection with the anti-erosion project during the year, were planted on terrace banks in cultivated lands, many of which were under wheat, thus providing temporary protection for the trees against stock.

Peach trees are being planted in order that the diet of the Natives may be supplemented by fresh and dried fruit. In addition, the trees emphasise the demarcation of the terraces.

(8) Fencing.

The area fenced in connection with anti-erosion work in the territory is as follows:—

Area fenced during the year	386 acres.
Area previously fenced	267½ acres.
Total area fenced	653½ acres.

Twenty-one separate areas, suffering from excessive sheet and gully erosion, were fenced in the various districts during the year, and were planted to trees.

In addition, three dams were totally enclosed and numerous dam embankments and grass inlets were protected by the erection of fencing.

(9) Maintenance.

The cost of regrading banks trampled down by stock before the banks had become consolidated, formed a considerable proportion of the total maintenance expenditure for the year.

Hailstorms, to withstand which no terrace system can economically be designed, did appreciable damage in certain areas during the year, and heavy, unseasonable rains were responsible for a number of breaks in a new terrace system, where protective works had not been completed.

In view of the great length of terrace bank already constructed, however, and the difficult conditions which exist in Basutoland for soil conservation work, maintenance for the year has been extraordinarily small.

TRACTION AND PLANT.

(1) Animal Traction.

With the acquisition of power plant, the number of oxen employed on soil conservation work in this territory was cut down to twenty-four per district. This number of oxen has been retained for the harrowing of banks, the cutting of openings in terraces and as an adjunct to plant in the various other phases of construction work.

Head yokes have been under trial during the second half of the year, and have proved highly efficient, one ox fitted with this type of yoke being able to do nearly if not as much work as two under the usual type of double yoke; in consequence, it is anticipated that head yokes will shortly supercede all other types.

(2) Plant.

Heavy plant purchased during the year:

- 4 Fowler 4/40 Tractors.
- 4 Sawyer Massey Imperial 16 Graders.

Heavy plant previously purchased:

- 3 Caterpillar RD 4 Tractors.
- 1 Caterpillar No. 22 Tractor.
- 2 Caterpillar No. 22 Graders.
- 1 Caterpillar No. 33 Grader.

Ploughs:

One Ransome's Solotrac TSIE plough was procured on trial during the year, and soon proved itself to be extremely satisfactory. In consequence, a Solotrac plough was purchased for each district. The plough can be drawn either by animal or by power traction; in the latter case, it is controlled by the tractor driver. The plough is strongly constructed, with a heavy beam and is fitted with a bar point. It is thus suitable for work in hard, stony localities.

The Ransome's pick plough purchased for trial last year did extremely good work, but the need for this type of plough has been filled by the Solotrac ploughs recently purchased.

Harrows:

Ransome's flexible steel harrows continue to prove satisfactory for the smoothing of terrace banks after construction by plant. In certain cases, the harrows are hitched behind the plant on the final round of terrace cut, and this procedure obviates a special harrowing round.

Two Parmiter chain harrows were procured on trial towards the end of the year. They are doing good work.

Ditchers:

Numerous alterations were made to the Eaton ditcher procured last year for trial. The improved Eaton ditcher is well constructed, and, behind the Solotrac plough, throws a well-proportioned bank.

Graders:

The Caterpillar graders have proved extremely satisfactory. The No. 33 grader shows less sign of wear than the No. 22's, but this is understandable, as it is a far heavier and more robust machine.

The four Sawyer Massey Imperial 16 manual control graders, recently purchased for use behind the Fowler 4/40 tractors, appear fully satisfactory.

Tractors:

The three Caterpillar RD 4 tractors have proved fully satisfactory under all conditions. No major troubles were experienced during the year and, excluding the cost of the annual overhaul which was carried out in June, the repair bill was extremely small.

The Caterpillar No. 22 tractor suffered a major breakdown in March, but otherwise gave no trouble, and did very good work during the year. It also was completely overhauled in June.

To comply with the conditions of the Colonial Development Fund Grant, four Fowler 4/40 tractors of British manufacture were purchased during the year. These tractors are of forty horsepower, developed by a four-cylinder Diesel engine.

Fuel Consumption and Running Costs:

Caterpillar RD 4 tractors:

Total number of hours worked by the three tractors during the year	4.655 hours.
Mean fuel consumption (Diesel fuel)	1.38 gallons per hour.
Mean running cost (fuel, oils, repairs, overhaul expenditure, etc.)	3.70 shillings per hour.
Mean total cost (inclusive of depreciation, but exclusive of wages of plant operators) ..	4.85 shillings per hour.

Caterpillar No. 22 tractor:

Total number of hours worked by the tractor during the year	1,323 hours.
Mean fuel consumption (petrol)	1.53 gallons per hour.
Mean running cost (fuel, oils, repairs, overhaul expenditure, etc.)	3.43 shillings per hour.
Mean total cost (inclusive of depreciation, but exclusive of wages of plant operators) ..	4.07 shillings per hour.

Fowler 4/40 tractors.

Owing to the short period for which the Fowler tractors have been employed in the territory, the unit running costs obtained are not of sufficient accuracy for purposes of comparison, and hence are not given.

IRRIGATION.

The possibilities of irrigation in Basutoland have been investigated during the year. Investigations were mainly confined to schemes in the south-western portion of the territory, which is a very dry area and is the first to suffer during droughts.

Of the numerous possible irrigation schemes inspected during the year, nine warranted consideration. Reconnaissance surveys were made of these nine possible schemes, which resulted in six being selected for proposed construction.

GENERAL.

(1) Sir Alan Pim and Mr. Milligan visited the territory early in November, 1937. Inspections were made of soil conservation work at Mafeteng, Matsieng, Pack Saddle and the Maseru Reserve.

During the year numerous officials from the Union, Northern Rhodesia, Kenya, Uganda and Tanganyika, and many private visitors from various parts, have examined the soil conservation work done in the territory and studied the methods adopted. Their interest in and appreciation of the work has been most gratifying.

(2) The Agricultural Department Conference was held from the 22nd to the 24th September, 1938. The first two days were spent in discussion. The morning of the third day was devoted to a field inspection of many phases of soil conservation work, and in the afternoon practical points connected with the work were discussed.

The conference was extremely valuable, and it is hoped that the various measures advocated, to facilitate soil conservation in this territory, will be brought into force at an early date.

OUTCOME OF SOIL CONSERVATION WORK.

As a result of the experience gained by the Department in putting into practice the most modern theories of soil conservation, the various aspects of the work have become clarified, and the most suitable methods in the design and construction of terrace systems, have been determined.

It has also become apparent what administrative action is necessary to ensure that the fullest benefit is derived from the soil conservation measures being undertaken.

Construction of Terrace Systems.

The following are a few of the more important aspects of terrace construction in Basutoland, which have become apparent:

- (a) **Cut-off Works.** Protection of terrace systems in cultivated lands, by the construction of heavy cut-off works for the interception and disposal of flood waters from upper catchments, is essential. The construction of an efficient cut-off system ensures the minimum of maintenance of the terraces below.

Cut-off works should be constructed as high up the catchments as reasonably possible.

In general, the method whereby flood water from catchments above permanent pastureland is spread evenly over the pasture by means of interrupted terraces, has proved satisfactory, and the pasture has benefited greatly.

- (b) **Interrupted Terraces in Lands.** The construction of interrupted terrace banks in cultivated lands has not proved successful and is being avoided wherever possible. Scouring of the lands frequently occurs below the openings in the banks, with resultant silting of the furrows of the lower terraces. In addition to the damage done to the lands, the accumulation of silt in the furrows usually results in breaching of the terrace banks.
- (c) **Disposal.** In the design of a terrace system, it is essential that provision be made for the disposal of excess water. If no convenient natural means of disposal, such as a permanent pasture strip or rock ledge, exists, a grass inlet is constructed, dropping the excess water back into one of the principal drainage lines of the area.

In the case of terrace systems in large tracts of cultivated lands where there are no natural disposal points, the establishment of meadow strips, running from the crest to the foot of the slopes, is the most practical method for disposing of excess water from the terrace systems.

- (d) **Terrace Grade.** The grade on which terraces are constructed varies considerably according to conditions. Terraces are seldom given a grade greater than 1 in 300, which may be considered a maximum for normal conditions encountered in the territory.

Variable grade terraces, increasing in grade by 0.1ft. per 100ft. at 600ft. intervals, have proved very satisfactory.

- (e) **Maximum Length.** It has been found that, in general, an uninterrupted terrace should not greatly exceed 600 yards in length. Owing to the rareness in Basutoland of suitable natural means for disposal of excess water from terrace systems, a limiting length of 1,000 yards has been stipulated.
- (f) **Terrace Furrow.** The advisability of constructing terraces with a comparatively wide base of not less than 13ft., and with a clean, 2ft. 6in. to 3ft. wide upper furrow has become apparent. Where necessary, an extra round of the plant, for the sole purpose of obtaining the requisite width of furrow, is fully warranted.
- (g) **Protection of Banks.** Protection of terrace banks by the establishment of a permanent vegetative cover is essential.

Administrative Measures.

Experience in Basutoland has shown that administrative assistance with regard to the following points is necessary, in order that the soil conservation work be facilitated and that the measures undertaken may prove fully effective:—

- (a) **Cutting through lands.** In the construction of terrace systems in cultivated lands, it is necessary to cut banks through the various individual fields, irrespective of ownership or the degree to which the fields are subdivided by the banks.

No work in cultivated lands could have been performed unless this procedure had, from the commencement, been accepted by the Native people without legislation which would otherwise have been necessary.

- (b) **Period of construction.** Owing to the two-crop system practised in Basutoland and to the fact that cultivated lands comprise approximately three-quarters of the total area to be reclaimed, a system of work, as outlined in the previous Annual Report, was adopted, whereby an endeavour was made to accumulate partially completed work during the period of the year when the crops are off the lands.

It has been found, however, that owing to the great variation in dates of sowing of crops, this period is too short for sufficient work to be accumulated. It thus becomes necessary to undertake the cutting of terraces through cultivated fields during a set period, the period advised being from the beginning of June to the end of September.

- (c) **Contour ploughing.** Ploughing on the contour between terraces is now generally practised, but cases have occurred where fields have been ploughed up and down the slope with resultant injury to the terrace banks and furrows. This should be prohibited.
- (d) **Cultivating terrace banks.** Under the present conditions, a permanent dense vegetative cover on all banks is essential for structural permanence of terrace systems, so cultivation of the terrace banks is undesirable.
- (e) **Establishment of vegetative cover.** Due to the increasing practice of herding stock up and down the terrace banks in lands under crops, the lucerne, blue grass and other valuable plants, sown or planted on the banks, have very little chance of becoming established.

To enable the vegetative cover to become thoroughly established, banks in cultivated lands should not be grazed during the period September to May, which corresponds with the time the crops are growing on the lands.

- (f) **Maintenance of terraces.** Maintenance of terrace banks and furrows should be carried out by the Native land-occupiers themselves, as it is impossible for thorough, regular inspection of the huge terrace systems already constructed, to be made by the Department. The amount of work required from each land-occupier, to maintain the terraces through his lands, would be very small indeed, whilst the terraces through pastures and villages should be maintained by the community.
- (g) **Meadow strips.** The future creation of meadow strips, for the disposal of excess water from terrace systems in cultivated lands is regarded as absolutely essential,

although numerous difficulties attend their introduction. Their establishment and protection, however, are necessary.

- (h) **Protection of dams and inlets.** Protection of dam embankments, grass inlets, etc., by the erection of fencing or by other means, is essential.
- (i) **Fencing denuded areas.** It is considered necessary to enclose any excessively eroded area, especially when the area forms a part of a catchment above cultivated lands.
- (j) **Grass burning.** Soil erosion in Basutoland has been very greatly accelerated by the practice of burning pastureland, a great proportion of which is situated on steep mountain slopes above cultivated lands.

The control of grass burning on hill and mountain slopes is necessary, in order that terrace systems, already constructed, may be safeguarded against excessive run-off, and that the process of erosion in lands not yet terraced, may be reduced to a minimum.

- (k) **Gully reclamation.** For successful gully reclamation, grazing in the gullies should not be allowed until the trees and grasses planted have become thoroughly established.
- (l) **Rotational grazing.** The Ecological Survey carried out in 1936/37, has recommended that simple systems of rotational grazing be introduced, both in the mountain and lowland areas. This will greatly assist in checking existing erosion and reducing erosion in the future.

Introduction of Administrative Measures.

A great deal of time has been spent on tactful negotiation to win the confidence of the Chiefs and people, with a view to securing their willing support for the innovations enumerated under the heading of "Administrative Measures."

The time taken in this method of procedure has been considerable, but was well worth while, as the bulk of public opinion is now with us and not against us. The confidence now established will prevent any question of general passive or active resistance being engendered by the introduction of any legislation or orders which may become necessary because of obstruction by individuals.

The delays and time taken in negotiation are, therefore regarded not as a waste of time, but as time well spent in gaining the confidence, co-operation and support of the bulk of the people.

PART III.

FINANCIAL STATEMENT.

The sum of £160,233 from the Colonial Development Fund became available on the 1st October, 1936, for anti-soil erosion work in this territory.

Revenue.
Nil.

Expenditure.
£28,486

The above expenditure includes the amount expended on the purchase of plant.

The period covered by this report is from 1st October, 1937, to the 30th September, 1938.

PART IV.

LEGISLATIVE CHANGES.

During the period under review there have been no legislative changes affecting anti-erosion work in the territory.

(Sgd.) E. R. ROBERTS,
Engineer to the Agricultural Department.

